

Rock & Gem

MARCH 2015 | VOL. 45 ISSUE 03

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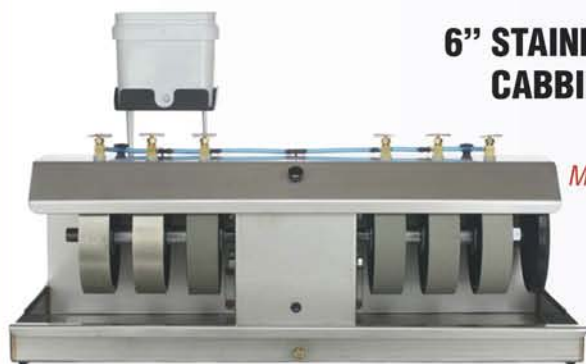


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Stock No.	Mesh/Grit	List	SALE
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1-1024	220	117.00	86.00

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A resin-bonded diamond belt that is mounted on a 3/8" of soft sponge rubber on a hard plastic hub wheel. All wheels have a 1" bore and are supplied with a reducing bushing for all size shafts, 3/4", 5/8" or 1/2". Shipping weight 1 lb. **May mix & match for Discount.*

Stock No.	Mesh/Grit	List	SALE	+4 SALE*
3-0300	280	\$75.00	\$55.00	\$48.50
3-0301	600	75.00	55.00	48.50
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3-0332	600	85.00	72.25
3-0333	1200	85.00	72.25
3-0334	3000	85.00	72.25
3-0335	Set of 4	289.00	----



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FREE Catalogs



Rock & Gem

Volume 45, Number 03

March 2015

ON THE COVER

This colorful stromatolitic jasper is similar in makeup to that which comes from the Mary Ellen mine in St. Louis County, Minnesota, but was found in a gravel pit in Carlton County, 60 miles away. (Tom Shearer specimen and photo)

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Notice: On rare occasions, typographical errors occur in prices listed in magazine advertisements. For this reason, advertisements appearing in *Rock & Gem* should be considered as requests to inquire, rather than as unconditional offers to sell. All prices are subject to change without notice.

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MEDIA

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Rock Bound Rockhound All Shook Up

—Ronald J. Yadusky, BS, MD, FACS

An old prospector friend and I
Will in his helicopter fly
To a new adventure today,
Where plate tectonics has its way.
It is an old subduction zone,
Where we'll be digging all alone
Into an exposed pegmatite
To search for what is shiny bright.
It's gemstones that we have in mind.
We both know that's what we will find.
It's in a mountainous terrain,
And we have checked, it will not rain.
I climbed aboard with all my gear.
We have not done this since last year.
We took off heading toward the sun.
I like rock hounding, it is fun.
We used global positioning
From satellite for our bearing.
The mountains soon came into view,
Where we would land I had no clue.
Then I saw a small level spot
Between mountains, not near the top.
It was the bank of a river,
Which from the air seemed a sliver.
The level spot had some debris
Of small rocks dynamited free.
Or hammered loose from up above
By someone full of gemstone love.
We landed and then had to climb
The mountain side for a short time,
Until we reached a cave-like crack.
I never thought of turning back.
We entered and went right to work,
And followed the crack to its fork.
It was dynamited before,
There was no need for any more.
This crack could hold far more than two,
And both of us knew what to do.
There was mica, quartz and feldspar,
We knew gemstones could not be far.
My eye then spied a red garnet
Of golf ball size that I should get.

My rock hammer freed it from rock;
I wrapped it safe in an old sock.
Garnet's color is, it's been said,
Mysterious deep purple-red.
Not bright red like a firehouse,
Yet full of fire you can't douse.
We worked until we got our share,
And there was even more to spare.
What prompted us to leave right then
Is something that's beyond my ken.
We both descended how we came
To load the helicopter's frame.
What happened next I can't be sure.
It happened with our gear secure.
The mountain shook and rocks did fall.
I could not stand, but had to crawl.
My friend said, "Stand! Control your fear,
Before that landslide settles here!"
I pulled myself in through the door.
I felt vibrations through the floor.
Everything seemed to be moving,
When rocks fall don't think of staying.
The shaking seemed to last minutes.
Pebbles hit us like small peanuts.
They deflected off the rotor
To add to the noisy motor.
As his craft lifted and it banked,
We both silently prayed and thanked
Our God who helped us fly from there,
And helped lift us high in the air.
The motor surged; we flew away
To return there another day.
If we did not leave when we did,
We'd be buried, our bodies hid.
We had survived an earthquake's shock
That shook us both and tumbled rock.
Quickly you hide or get away
To live and have something to say.
What I would tell is how it feels
To see beauty; how it appeals,
And what it means to gather gems,
The kind that's put in diadems.

January Cover

I was pleased to see an actual person on the cover of the January issue. The mineral specimens are beautiful, but this picture gives a better sense of the hobby. I hope to see more covers like this in the future.

—Mary French
Cedar Springs, MI



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Deborah Weaver, OR
Finalist, Gemstone
Jewelry-Making Contest



LAPIDARY OF THE MONTH

Working in the lapidary field for about eight years does not qualify me as a jewelry artist. However, being a mechanical engineer, a wood carver, and an artist, painting and drawing with different media, helped me with my new hobby in rockhounding, faceting, grinding and polishing beautiful cabochons.

Silversmithing is where I use my talent to design and create one-of-a-kind jewelry such as this pendant.

A few months ago, I had the privilege of learning how to fuse Argentium® silver from Ronda Coryell, co-founder of Jewelry Studies International. Argentium is tarnish-resistant material that also fuses very easily, using a technique of fabricating with no solder.

This pendant is the first one I did after I took the class; the cabochon is plume agate that I cut and polished awhile back. The idea was to keep the druse visible on the side without covering it with the bezel.

I started the fabrication as per my design. I hardened a 20-gauge wire by stress relieving and stretching it; I held one end in the vice and pulled the other end with a pair pliers. I cut the wire and bend the pieces to size for later use. I made the granules with leftover wire and put them aside. I then took a 20-gauge sheet of Argentium and traced the cabochon to create the base. But before I cut it, I drew the cutout design in the center, leaving enough room for my logo and stamps.

I first sawed the center shape, because it's easy to control. I followed by cutting the outside shape using the cabochon profile. I selected the Argentium bezel and I bent it around the cabochon, leaving the druse side exposed. The bezel is wrapped around the top and bottom corner to securely hold the cabochon in place. I then assembled all the components to make sure everything fit properly. Now I was ready to start the fusing process.

Initially, I decided to fuse the bezel onto the base, then add the wires and the granules in position, but I ultimately decided to assemble everything at once and fuse them all at the same time. I knew this would be difficult, because the Argentium parts differed in thickness. I had to be quick and precise in applying the heat with my torch where it needed to go.

I stamped my logo on the back and I filed the profile using the bezel as a guide. I then coated all the pieces with flux and assembled them over a charcoal block. I fused all the parts and the granules together with the torch and waited for them to cool before submerging the piece in water. I pickled it to remove the flux, cleaned and polished it, set the cabochon firmly in the bezel, and then added the bail in the opening between the two top granules—a new pendant was created.

—Elie Ghanime
EG Jewels
Sylvania, OH



Would you like to be named Lapidary of the Month?

To enter the contest:

- Write a 500-word step-by-step description of how you crafted your lapidary project from start to finish. Save it as a document file.
- Take at least one sharp, close-up, color digital photo of the finished project. Photos must be high-resolution (300 dpi at 4 inches by 5 inches, minimum).
- Attach your document file and digital photo (.tif or .jpg) to an e-mail and send it to editor@rockngem.com with the subject line "Lapidary of the Month".
- Make sure you include your name and street address (not a PO Box)



for prize delivery should your entry be selected for publication. Only winners will be notified. E-mail the editor or call (972) 448-4626 with any questions about these requirements.

Lapidary of the Month winners receive a two-speed Dremel Model 200 N/40 MultiPro kit and a wall plaque in recognition of their creativity and craftsmanship. Winning projects are also posted on our Web site, www.rockngem.com.

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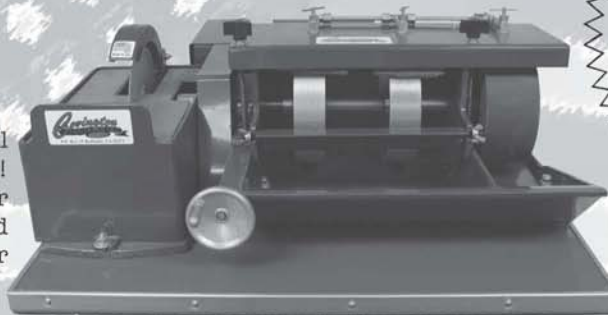
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Orlando, FL.....January 9-10-11
Tucson, AZ.....Jan. 31-Feb. 13

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Franklin, NC.....May 8-9-10
Livonia (Detroit), MI.....July 10-11-12
Franklin, NC.....July 23-24-25-26
Spruce Pine, NC.....July 30-31-Aug. 1-2
Tucson, AZ....September 10-11-12-13
Minneapolis, MN....September 27-28
Livonia (Detroit), MI....October 2-3-4
West Springfield, MA.....Oct. 9-10
Asheville, NC.....October 20-21
Orlando, FL.....October 23-24-25

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SHOW DATES

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Submit show date information at least four months in advance using the electronic form at www.rockngem.com.

March 2015

6-7—COLVILLE, WASHINGTON: Annual show; Panorama Gem and Mineral Club, Colville Fairgrounds Ag Building; 317 West Astor; Fri. 8:30 am-6 pm, Sat. 9 am-5 pm; Admission is Free; contact Bill Allen, (509) 935-8779; e-mail: sago@theofficenet.com

6-8—DEL MAR, CALIFORNIA: Wholesale and retail show; Gem Faire Inc, Del Mar Fairgrounds; 2260 Jimmy Durante Blvd; Fri. Noon-6pm, Sat. 10am-6pm, Sun. 10am-5pm; Admission \$7, Children free (ages 0-11); Fine jewelry, precious & semi-precious gemstones, millions of beads, crystals, gold & silver, pearls, minerals & much more at manufacturer's prices. Exhibitors from around the world. Jewelry repair & cleaning while you shop. Free hourly door prizes.; contact Yooy Nelson, (503) 252-8300; e-mail: info@gemfaire.com; Web site: <http://www.gemfaire.com>

6-8—NEWARK, CALIFORNIA: Show and sale; Mineral and Gem Society of Castro Valley, Newark Pavilion; 6430 Thornton Ave.; Fri. 10:00 am-6:00 pm, Sat. 10:00 am-6:00 pm, Sun. 10:00 am-5:00 pm; Admission \$6.00 3 day pass, Children <13 Free w/ adult; 67th Annual Show & Sale. Over 40 dealers selling Jewelry, Gemstones, Minerals, Fossils, Beads, Faceted Stones, Books, Tools. Also Demos, Exhibits, Fluorescent Room, Kids Spinning Wheel, Geode Splitting, Door Prizes, Raffles, Live Auction. Free parking.; contact Cathy Miller, 20948 A Corsair Blvd., Hayward, CA 94545, (510) 887-9007; e-mail: showchair@mgscv.org; Web site: www.mgscv.org

6-8—RICHMOND, INDIANA: Annual show; Eastern Indiana Gem & Geological Society, Wayne County Fairgrounds; 861 N. Salisbury Rd.; Fri. 10-6, Sat. 10-6, Sun. 11-4; adults \$5, seniors \$3, students \$1, children (under 7) and Scouts and leaders in uniform free; jewelry, minerals, fossils, displays, demonstrators, silent auction, children's activities; contact John LaMont, 1271 Fairfield Ave., Brookline, IN 47012, (765) 647-4894 or (937) 339-1966

6-8—LARGO, FLORIDA: Annual show; Suncoast Gem & Mineral Society, Minnreg Hall; 6340 126th Ave. No.; Fri. 10-6, Sat. 10-6, Sun. 10-5; adults \$5, students with ID \$4; contact Bill Schmidt, SGAMS, PO Box 13254, St. Petersburg, FL 33733-3254, (727) 822-8279; e-mail: SGAMSGemshow@gmail.com; Web site: www.sgams.com

6-8—RICHMOND, INDIANA: Annual show; Eastern Indiana Gem & Geological Society, Wayne Co. Fairgrounds; 861 N. Salisbury Rd.; Fri. 10:00 am-6:00 pm, Sat. 10:00 am-6:00 pm, Sun. 11:00 am-4:00 pm; Adults \$5.00, Seniors \$3.00, Students \$1.00, Children Under 7 FREE; Raffle-27" Amethyst cathedral; contact Judy Burton, 912 Kent Ln., Troy, OH 45373, (937) 339-1966; e-mail: jleeburton@woh.rr.com; Web site: eiggs.weebly.com

6-9—ARCADIA, CALIFORNIA: Annual show; Monrovia Rockhounds, Arboretum Botanic Gardens; 201 S. Baldwin Ave.; Sat. 9-4:30, Sun. 9-4:30; Arboretum admission: adults \$9, seniors and students \$7, children \$4; more than 15 dealers, beads, lapidary, jewelry, minerals, rocks, raffle, grab bags, treasure wheel, geodes, silent auction, kids' corner; contact Rudy Lopez, (626) 351-6283; e-mail: rclopez002@verizon.net; Web site: www.moroks.com

7-8—NEWARK, DELAWARE: Annual show; Delaware Mineralogical Society, Delaware Technical & Community College-Stanton Campus; 400 Stanton-Christiana Rd.; Sat. 10-6, Sun. 11-5; adults \$6, seniors \$5, students (12-16) \$4, children (under 12) free with adult; educational exhibits of mineral, lapidary and fossil specimens, regional and university museum displays, dealers, minerals, fossils, gems, jewelry, lapidary supplies, door prizes, demonstrations, gem cutting and polishing, children's table, inexpensive mineral and fossil specimens; contact Gene Hartsteinn, 9 Verbena Dr., Newark, DE 19711; e-mail: gene@fossilnut.com; Web site: www.delmineralsociety.org

7-8—CALDWELL, IDAHO: Annual show; Owyhee Gem & Mineral Society, O'Conner Field House; 2200 Blaine; Sat. 10-6, Sun. 10-5; adults \$3, children (11 and under) free with adult; dealers, demonstrators, door prizes, grand prize, showcases, black light display, silent auction, Wheel of Gems, sand dig, grab bags; contact Susan Beattie, 104 N. Poplar St., Nampa, ID 83651; Web site: www.owyheerocks.com

7-8—VENTURA, CALIFORNIA: Annual show; Ventura Gem & Mineral Society, Ventura County Fairgrounds; 10 W. Harbor Blvd.; Sat. 10-5, Sun. 10-4; free admission; gem, mineral, fossil and lapidary exhibits, 15 dealers, jewelry art demonstrations, silent auctions, raffle, kids' activities, white elephant country store and plant sale; contact Krishna Juarez, PO Box 1573, Ventura, CA 93002, (805) 323-6725; e-mail: info@VGMS.org; Web site: www.vgms.org

7-8—ROBSTOWN, TEXAS: Annual show; Gulf Coast Gem & Mineral Society, Richard M. Borchard Regional Fairgrounds; 1213 Terry Shamsie Blvd; Sat. 10:00 AM-6:00 PM, Sun. 10:00 AM-5:00 PM; Admission \$5.00 for a 2 day pass, Children 12 & under free with adults; Scouts in uniform free: hourly door prizes, grand prize drawing, raffle, touch table, mineral & gem identification, demonstrations, 20+ case exhibits, silent auction, kids wheel of rocks, 25+ dealers, fluorescent case, rocks, minerals, fossils, slabs, cabs, rough, gemstone jewelry, tools equipment, books, geodes, handmade jewelry, amber, agates, petrified wood, and much more.; contact Linda Simpson, 1302 Annapolis Dr, Corpus Christi, TX 78415, (361) 877-5820; e-mail: lsimp@swbell.net; Web site: www.gcgms.org

7-8—ARCADIA, CALIFORNIA: Annual show; Monrovia Rockhounds, Los Angeles Arboretum Botanic Gardens; 201 S. Baldwin Ave; Sat. 9-4:30, Sun. 9-4:30; Admission \$9, Seniors \$7, Students \$7, Children \$4; More than 15 dealers, beads, lapidary, jewelry, minerals, fossils, rocks, raffle, grab bags, treasure wheel, geodes.; contact Jo Anna Ritchey, 224 Oaks Ave, Monrovia, CA 91016, (626) 359-1624; e-mail: joannaritchey@gmail.com; Web site: www.moroks.com

7-8—BIG SPRING, TEXAS: Annual show; Big Spring Prospectors Club, Howard County Fair Barn; Big Spring Rodeo Grounds; Sat. 9:00 A.M-5:00 P.M., Sun. 10:00 A.M-5:00 P.M.; Admission Free; contact Lola Lamb, 2200 Cecilia, Big Spring, TX 79720, (243) 263-3340; e-mail: lolabellelamb@yahoo.com

12-15—DEMING, NEW MEXICO: 50th Annual Rockhound Roundup Gem & Mineral Show; Deming Gem & Mineral Society, SWNM State Fairgrounds; 4100 Raymond Reed Blvd.; Thu. 9-5, Fri. 9-5, Sat. 9-5, Sun. 9-5; free admission; more than 100 dealers, rough rock, slabs, cabs, handcrafted jewelry, rock-related items, lapidary tools, supplies and equipment, educational demonstrations, children's activities, displays, silent auctions, live auction, drawings, Spinning Wheel, guided field trips; contact Marilyn Page, PO Box 1459, Deming, NM 88031, (575) 544-9019; e-mail: thedgms@gmail.com; Web site: www.thedgms.com

13-15—KANSAS CITY, MISSOURI: Annual show; Greater Kansas City Association of Earth Science Clubs, KCI Expo Center; 11730 NW Ambassador Dr; Fri. 9 AM-8 PM, Sat. 10 AM-7 PM, Sun. 10 AM-5 PM; Admission \$6, Children 5-12 \$3; 0-4 Free; 70+ Retail and wholesale dealers; swap; educational exhibits and lectures; benefit auction.; contact Bruce Stinemetz, 2706 S Cherokee, Independence, MO 64055, (816) 795-5159; e-mail: kcgsinfo@yahoo.com; Web site: www.kcgemshow.org or www.gemshowkc.org

13-15—PLEASANTON, CALIFORNIA: Wholesale and retail show; Gem Faire Inc, Alameda County Fairgrounds; 4501 Pleasanton Ave; Fri. Noon-6pm, Sat. 10am-6pm, Sun. 10am-5pm; Admission \$7, Children Free (ages 0-11); Fine jewelry, precious & semi-precious gemstones, millions of beads, crystals, gold & silver, pearls, minerals & much more at manufacturer's prices. Exhibitors from around the world. Jewelry repair & cleaning while you shop. Free hourly door prizes.; contact Yooy Nelson, (503) 252-8300; e-mail: info@gemfaire.com; Web site: <http://www.gemfaire.com>

13-15—VICTORVILLE, CALIFORNIA: 39th annual; Victor Valley Gem & Mineral Club, Stoddard Wells Tailgate; I-15 Exit 157, Stoddard Wells Rd., 11 miles NE of I-15; Daily 8-5; free admission; outdoor event, Saturday field trip for tri-colored marble, silent auctions Saturday and Sunday, more than 50 dealers, rough, slabs, cabs, handcrafted jewelry, minerals, fossils; contact Brett Ward, 15555 Main St., #D4, PMB 214, Hesperia, CA 92345, (760) 954-4323; e-mail: bretts88@verizon.net; Web site: www.vvgmc.org

13-15—HILLSBORO, OREGON: Annual show; Tualatin Valley Rock & Gem Club, Hillsboro Fair Plex; 873 NE 34th Avenue;

continued on page 34



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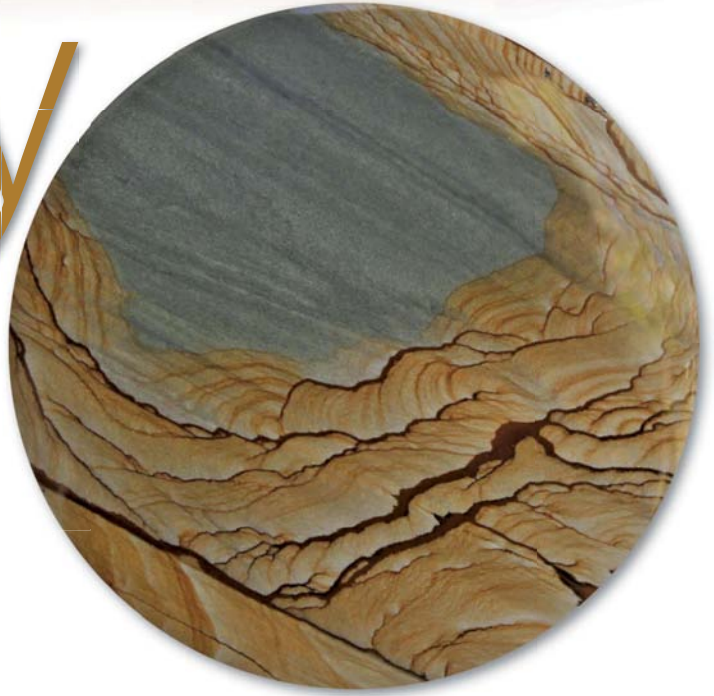
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The Windy Ridge Mine



Still a Wellspring of Landscape and Picture Jasper

Story by Lauritz A. Jensen and Steven P. Schultz / Photos by Lauritz A. Jensen

Only a handful of hardrock miners still work claims in the Owyhee Canyonlands these days, a far cry from the pre-millennial glory years when hoards of seasoned prospectors and wishful greenhorns swarmed over the southeastern Oregon countryside in hopes of discovering unique and exquisite jaspers.

To be accurate, a lot of people were searching for precious metals or possibly clinoptilolite zeolite, but the potential for profit if a premium jasper bed was unearthed was unquestionably on their minds. After all, 40 years ago jasper—especially the alluring picture jasper—was the rage, and miners earned good money selling this material to collectors and lapidaries. Currently, it is estimated that at least 75 different Owyhee jaspers are still being offered at estate sales or traded by private collectors, although most are available in only limited amounts (*Picture Jaspers: Treasures of the Owyhee Area*, Oregon, by Hans Gamma, 2011).

Dozens of varieties seem to have disappeared from the marketplace altogether.

Sooner or later, mines play out, prospectors vanish from the scene, worldwide economic downturns cause sellers and customers to lose interest in the lapidary arts, and vast plots of land are declared off limits to mining because of new and more rigid ecological regulations. Wilderness Study Areas, managed by the Bureau of Land Management (BLM), now drastically restrict prospecting in huge swaths of land located in the Owyhees, areas that were open to the public just a few years ago.

Even amateur rockhounding is controlled. One of the better-known and prolific mines that has endured, however, is Windy Ridge, in the Crisman Hill area. The site still produces some of the most pleo-

perfect specimens of picture or landscape jasper in the world, namely Cripple Creek and, to a lesser degree, Windy Ridge.

The Crisman Hill area is home to many other impressive and not so impressive silicates. Coyote Ridge and Palisade jaspers are two examples, but many other named and unnamed varieties are also present. A distinctive variety that has serious promise occurs in this general area on a private ranch. Some of the material features wavy bands throughout the rock. The pattern resembles a sky that is streaked with red or, at times, completely suffused in crimson.

The quantity of rock is still in question, however, in part because the ranch owner is reluctant to open up his land to open-pit mining and run the risk of broadcasting the exact location to trespassers and poachers. For the moment, therefore, it does not have a strong presence commercially. On the other hand, the bounty and quality of picture jasper harvested from the Windy Ridge mine is quite astonishing, and the supply does not appear to be diminishing any time soon.

Up to now, the history of the mine has never been fully revealed. It all started with

ABOVE: Stratification, a distinctive attribute of this jasper group, is especially evident in this 3-inch cab. The piece was crafted for a tabletop display.

Lou Mallard, when he stumbled upon the site around 1973. He was bow hunting in the Owyhees and ventured onto a windy ridge—hence the name of the mine—and spotted an area that was strewn with float material. After days of meticulously inspecting the terrain, he eventually was able to trace the broken pieces and chunks of rock back to the source: an outcrop of brown and bluish-gray jasper.

Recognizing the possibilities of the discovery, he straightaway filed three claims, one for the mother lode that harbored most of the ore and a couple of adjacent claims to serve as buffers, or shields, against encroachment. He worked the spot for approximately two years, although he made no pretense about being a sophisticated miner. His real job was that of a construction foreman, having learned how to operate and maintain diesel equipment in the Pacific Theater during World War II. These skills would prove invaluable in his hardrock mining endeavor.

To work the claim, Lou borrowed a backhoe and a 1939 dump truck from the construction company. He would slip into the area on weekends, carefully covering his tire tracks all the way to the deposit. He then would dig down a mere 3 feet to the horizontal Windy Ridge layer, load the dump truck with rough, and finally, in an effort to be extra prudent, refill the hole with sand and tuffaceous debris. While labor-intensive, to say the least, to warily work a claim and protect your interests by not drawing attention to a find was the name of the game in those days.

As careful as Lou was, eventually “snipers” found his trove and started pilfering his most prized stock. Once, he even confronted trespassers on the land who had filled up the bed of their pickup truck with choice rock. Ultimately, he concluded that he could not guard his property 24/7 and that selling would be the most pragmatic decision. Brothers Billy and Bob Garrison agreed to pay \$10,000 and deliver to Lou 10 tons of rock in return for all rights. Like Lou, the brothers were not wealthy miners and at first did not even have the resources to make a down payment; however, one of their workers had a rich uncle, Walter “Stub” Vallotton, who reluctantly agreed to grubstake the operation.

Mahleir County records indicate that the Garrisons only worked the mine for two years and then abruptly left the area. Rumors have it that they were



Carefully selecting the most eye-stopping sector of a slab will prove satisfying to the lapidary when cabbing is the primary concern. An oxide or diamond paste produces a splendid polish.



The scenic backdrops of Cripple Creek Jasper offer a Western flair that works well for belt buckles.

either encouraged or ordered to “get out of Dodge”, so to speak. The brothers were evidently products of the countercultural movement of the 1960s, and their social values clashed with the conservative norms of the citizens of eastern Oregon. Furthermore, in the 1970s, premium jas-



Although somewhat crude, this knapped Cripple Creek jasper tool was most likely used by the Northern Paiute tribe to harvest camas tubers.

per was selling for a paltry \$3 per pound, and they needed a pile of money fast.

Their seemingly unending cache perhaps influenced them to undercut the prices of other jasper dealers from Oregon at the Quartzsite, Arizona, show. They actually sold the rock for as little as 25 cents a pound, which of course did not set well with the local miners. Ultimately, their purported bonanza did not pan out as they had hoped.

Next, Gem West Inc. took over the operation in 1976 and worked the claim for more than 20 years. In 1998, they finally vacated all three claims, allowing the land to go back to the BLM. Subsequently, Steven Schultz made application, and he is presently the proprietor and steward of this BLM parcel.

Apparently, long before white settlers expanded into Oregon, Native Americans utilized a variety of Owyhee jaspers, including material from Crisman Hill, to form crude points, knives and tools. Early explorers to the region often referred to the Northern Paiutes as “digger Indians”. They collected scabby floats—rocks similar to those at Windy Ridge and Cripple Creek—and knapped them into digging implements. The women of the tribe would use these crude devices to harvest camas. Bulbs from the plants were dried and pounded into flour and, along with wild onions and potatoes, were stored away for winter rations (*History and Culture of the Boise Shoshone and Bannock Indians*, by William D. Edmo, Dorrance Publishing Co., 2010).

We have examined knives and preforms in private collections—many of which purportedly were found on a private ranch—and all are without question jasper from this area. The Bannocks, a splinter tribe of the Northern Paiutes, also must have knapped in the Owyhees.

BLM and Mahleir County records refer to the mine as Windy Ridge. Considering the never-ending breezy conditions of the area, the mine and its most superficial layer of jasper are aptly named; however, the etymology of the second, deeper layer is somewhat enigmatic. No stream or arroyo in the region sports the moniker Cripple Creek, and there is no evidence that the name is ascribed to the renowned gold mine town in Colorado. Even the catchy 1970 bluegrass hit “Up on Cripple Creek”, by The Band, is a doubt-



A framed or unframed beverage coaster crafted from this jasper makes an attention-grabbing tabletop accessory and is sturdy enough to withstand everyday use.



Outcrops of pure jasper, like this one in the Crisman Hill area, undoubtedly enabled the first claim owner to identify the original deposit of Windy Ridge jasper.

ful source, mostly because the song is not about mining, but the whimsical fancies of a trucker who drank in excess and was forever daydreaming about an old flame.

This much we do know, however. The jasper from the mine became commonly referred to as Cripple Creek shortly after the Garrison boys took over spot. Moreover, according to Doug Caldwell, the nephew of Uncle Stub and the main pick-and-shovel man, the name was chosen because of the calamitous consequences of an acute sunburn that was obtained during a skinny dipping outing to Succor Creek, a respite from digging rock during the dog days of summer. Certainly it is a politically incorrect term by present-day standards, and regardless of the plausibility of the account, it remains unconfirmed.

The real issue here is that there are two coterminous jasper types in the pit. Neither name has ever been discredited (i.e., both remain active and are correct because they are distinctive and easy to separate). Regardless, the official and legal designation of the mine remains Windy Ridge.

Although the mine is located just a few miles west of U.S. Highway 95, driving to the site is anything but a causal weekend excursion. The bendonite-laden dirt road is not suitable for the average family vehicle and possibly even a two-wheel drive pickup truck. Much of the route is washed out, and as you approach the active excavation, the road is pretty much reduced to a trail. Moreover, following a rainstorm the road becomes slippery—an impassable mess actually—and traveling can be risky. Maneuvering through small herds of

Hereford, Angus, and mixed range-cattle breeds is a distinct possibility. Scavenging (including surface collecting) from this mine or any other site and trespassing on the private ranches in the area is illegal.

The Windy Ridge Claim sits at an altitude of about 4,800 feet and overlooks a shallow basin of native sagebrush and cultivated ranch land (much of it owned by the long-time denizen Tim McBride). Beyond, the more distant northern iconic formations, including Three Fingers Butte, are plainly visible from the ridge. At this point in time, the dig or lode claim is basically a 20-foot-deep pit, and there is a substantial overburden of zeolite in the unworked areas. It should be noted that much of the

ground has already been reclaimed with bluebunch and Siberian wheatgrass, big sagebrush, and bottlebrush—an absolute requirement of the BLM of any claim owner for reaping the benefits from public land in Oregon. Wildlife, including the chukar partridge, Hungarian partridge, valley quail, sagebrush voles, mule deer, coyotes, and rattlesnakes thrive and do not appear to be adversely affected by the operation.

As with other Oregon jaspers, the characteristic microcrystalline structure of either rock is most discernible with the aid of high magnification. For example, a scanning electron micrograph of 5000x leaves little doubt that the silicon dioxide, or quartz, crystals in jaspers are indeed minute structures, usually less than 3 μm in size. Moreover, the siliceous makeup of these microcrystals likely traces its origin back to compacted tuff, the so-called ash-flow tuff that is so abundant throughout the Owyhees. In this case, the tuff probably accumulated when volcanic ash from a distant but massive eruption settled onto a lake, where a lacustrine or alluvial deposit developed.

Under magnification, translucent bodies or irregular globules, possibly silica, are seen throughout the tuffaceous surface coat. Not surprisingly from a chemical standpoint, the crust is composed of a high percentage of silicon dioxide and aluminum. Iron and manganese impurities are also important components and play a significant role in the coloration of both jasper types. Although rare, remnants of the original or unaltered clastic sediment may show up internally, and the rough texture and blah color of



Landscape jasper changes the appearance of this ordinary 1928 style pinbox to a classic and rich earthy look.



Oftentimes, jasper from this mine exhibits an unusual or exotic design—imagery that is perfect for a framed specimen.

the ash remnant could negatively affect the quality of a jewelry piece. With little effort, however, hobbyists learn to work around this idiosyncrasy.

The actual beds of jasper lie in horizontal strata, or layers, separated for the most part by 15 to 20 feet of sandy earth and country rock. The two layers (Windy Ridge and Cripple Creek) converge at the southernmost section of the claim. The height of the scenic zones in Windy Ridge jasper varies from ½–5 inches, although years ago the classic material was often meatier. In contrast, the undulating seam of Cripple Creek ore is heavier and ranges in thickness from 8 to 18 inches. Pieces might easily weigh 100 pounds or even more. Chunks of both types of rock are typically sandwiched between a prominent tuffaceous crust.

Only about 1,000 pounds of premium Windy Ridge jasper was ever dug and is now believed to be nearly extinct. On the other hand, Cripple Creek jasper is plentiful, and it is estimated that 100 to 300 tons still remain; however, test holes drilled on the west side several yards from the claim did not produce any good quality rock. In spite of these negative results, the prevailing thought is that more ore will eventually show up as faulted pockets of jasper is a more realistic expectation than one continuous bed, especially in the Crisman Hill region.

We should point out that indiscriminate dozer practices by previous mine owners produced mixed loads of Windy Ridge and Cripple Creek rock, which were then sold to wholesale dealers and eventually to the general public. A lot of rock of both types mined before 2000 is still being offered sale to lapidaries at the annual rock shows and through online sources.



A Windy Ridge slab, although beautiful in its own right, has a tendency to be less intricate in its architectural design compared to a slab of Cripple Creek.



The firmament of Cripple Creek Jasper generally trends toward grayish-blue or grayish-green hues, in contrast to the lighter skies that are seen in Wildhorse and Succor Creek jaspers.

Like most Owyhee material, Windy Ridge and Cripple Creek are classified as volcanic jaspers that have their genesis in an alkaline-silica chemical reaction and the diagenetic alteration of tuff. More specifically, they are classified as stratiform types of volcanic jasper with typical hills and valley patterns produced by lines of iron oxidation (*Genesis and Classification of Agates and Jaspers: A New Theory*, by Marco Campos-Venuti, 2012).

In slabbed material, the horizontal stratifications are unmistakable, forming streaked skies and layered landforms. The familiar panoramic scenes that capture our imagination are in truth upside down images of how the rock is naturally positioned in the earth. Solutions of iron-bearing minerals infuse into the silicon dioxide to generate the khaki tans and darker earthy undertones.

The thick, dark-brown limonitic lines that outline the healed fractures and the finer limonitic Liesegang halos that give depth and shadows to the perceived hills and gullies

are largely products of more oxidized forms of iron. These lines and rings are likely crystalline goethite or a similar mineral that creates a barrier against further iron diffusion, at least at that specific point in the rock. Consequently, when gazing at a Cripple Creek jasper, it is easy to envision an assortment of geological features in the same slab. Imaginary sand dunes, windswept loess hills, rugged mountain ranges, active volcanoes, mesas, valleys, gullies, shallow swales, and narrow canyons are commonplace. The firmament is a pretty convincing facsimile of Mother Earth and may give the impression of a setting sun, patches of fog, or wispy clouds.

Compared to the busy architecture of premium Cripple Creek jasper, the scenes of Windy Ridge, for the most part, are not nearly as sophisticated or imaginative. The only exception to this rule occurs in the south sector of the claim, where both veins converge. Here, Windy Ridge exhibits curi-

Elements by Four Acid ICP-AES						
Cripple Creek and Windy Ridge Jaspers						
Analyte	CC (ppm or %)	WR (ppm or %)	Analyte	CC (ppm or %)	WR (ppm or %)	
Silver Ag	<.5 ppm	<.5 ppm	Manganese Mn	135 ppm	308 ppm	
Aluminum Al	2.96%	2.61%	Molybdenum Mo	<1 ppm	<1 ppm	
Arsenic As	6 ppm	<5 ppm	Sodium Na	0.14%	0.11%	
Barium Ba	150 ppm	110 ppm	Nickel Ni	4 ppm	2 ppm	
Beryllium Be	2.9 ppm	3.2 ppm	Phosphorus P	110 ppm	1830 ppm	
Bismuth Bi	2 ppm	<2	Lead Pb	10 ppm	11 ppm	
Calcium Ca	0.13%	0.54%	Sulfur S	0.01%	0.01%	
Cadmium Cd	.6 ppm	<.5 ppm	Antimony Sb	<5 ppm	<5 ppm	
Cobalt Co	1 ppm	1 ppm	Scandium Sc	2 ppm	1 ppm	
Chromium Cr	13 ppm	17 ppm	Strontium Sr	11 ppm	9 ppm	
Copper Cu	3 ppm	2 ppm	Thorium Th	<20 ppm	<20 ppm	
Iron Fe	1.04%	1.08%	Titanium Ti	0.10%	0.08%	
Gallium Ga	10 ppm	10 ppm	Uranium U	<10 ppm	<10 ppm	
Potassium K	3.37%	3.11%	Vanadium V	5 ppm	3 ppm	
Lanthanum La	40 ppm	40 ppm	Tungsten W	<10 ppm	<10 ppm	
Magnesium Mg	0.05%	0.06%	Zinc Sn	53 ppm	46 ppm	
(Assays and other tests were performed at the Arizona Department of Mines and Mineral Resources, Midwestern University, and ALS Geochemistry.)						

ously bizarre and unusual designs. Regardless, the earthy colors of Windy Ridge lean more toward the tans and off-white shades in the color palette, and only rarely do the reds and bright yellows appear.

The sky of both jaspers paints the image of a crepuscular, or twilight, time of day—an atmosphere of mottled or blotchy gray-green hues. To be more exact, the sky of classic Windy Ridge trends toward dark shades of green, even a midnight green that comes across as black in thick sections. The interaction or mixture of ferrous and ferric iron-bearing jasper arguably contributes to these darker shades. The Cripple Creek sky, on the other hand, is generally lighter. Interestingly, at least 25% of Cripple Creek specimens display only tans and browns and are completely devoid of the familiar greenish-gray skies. In the end, for identification purposes it may prove more

valuable for the lapidary to compare and contrast slabs with the photographs in this article or those published in texts. Internet sources sometimes can be a little deceiving, especially the auction or buy-it-now sites, as specimens are regularly misidentified.

In spite of the distinctive visual signatures of each rock, their chemical or mineralogical profiles are roughly equivalent. A hand-held Nitron XRF analyzer reveals that levels of iron, tin, zinc, and sometimes lead are comparable in both the more oxidized brown and the reduced greenish-gray zones. Iron is always the most prevalent trace impurity regardless of the zone.

Lithogeochemical ICP-AES analysis further elucidates the elemental composition of each rock and shows that both the celestial and khaki-brown zones are made up of approximately 85% silicon dioxide, with aluminum proving to be the second

most common element. Perhaps this is not front-page news, as such findings are expected for any jasper. The amount and distribution of iron oxides are a little more interesting and comprise roughly 1.5% of each jasper type. As expected, the brown zones of Cripple Creek possess less ferrous oxide compared to the greenish or celestial zones. Moreover, the percent of ferrous oxide is noticeably less in Windy Ridge jasper, but calcium and manganese are slightly higher.

In the sky zones of each rock sample, minute amounts of other elemental contaminants exist, including arsenic, barium, beryllium, cobalt, chromium, copper, gallium, potassium, lanthanum, magnesium, sodium, nickel, phosphorus, lead, sulfur, scandium, strontium, titanium, vanadium and zinc. Precious metals such as gold, silver and platinum have no significance.

ICP-AES Analysis				
Cripple Creek and Windy Ridge Jaspers				
Analyte (Oxide)	CC Brown Zones (%)	CC Green Zones (%)	CC Compacted Tuff (%)	WR Dark Green Zone (%)
SiO ₂	83.89	85.2	75.3	85.72
Al ₂ O ₃	6.36	5.79	9.82	5.17
Fe ₂ O ₃	1.89	1.5	1.84	1.65
CaO	0.6	0.18	0.99	0.75
MgO	0.1	0.13	0.44	0.09
Na ₂ O	0.2	0.2	0.28	0.17
K ₂ O	4.56	4.2	4.98	3.89
Cr ₂ O ₃	<.01	<.01	<.01	<.01
TiO ₂	0.17	0.17	0.3	0.14
MnO	0.02	0.02	0.01	0.04
P ₂ O ₅	0.273	0.026	0.033	0.429
SrO	<.01	<.01	0.01	<.01
BaO	0.02	0.02	0.08	0.02
FeO	0.76	1.08	—	0.89
(Assays and other tests were performed at the Arizona Department of Mines and Mineral Resources, Midwestern University, and ALS Geochemistry.)				

The tables herein summarize many of the chemical properties of each jasper type. Bottom line, these findings imply that an algorithm based on elemental compositions is not a useful or reliable classification tool for separating these two jaspers. Lapidaries and rockhounds still must rely on their outward appearances or clear-cut visual clues to make the correct identification.

From a hobbyist perspective, both jaspers behave like most other high-quality silicates and have undeniable lapidary potential. Both exhibit a consistent Mohs hardness of greater than 7, as determined by the Deluxe Hardness Pick Set and Mineral Identification Kit by Mineralab®. Consequently, each will take a resplendently brilliant and knockout shine. It really does not matter if you employ decreasing grits of diamond paste (e.g., 3,000, 8,000, 14,000, 50,000) or any of the several oxide com-

pounds as long as the cabochon or picture slab is properly prepared first. With its darker skies, Windy Ridge jasper is ideal for creating cabochons that have a somewhat bewitching, gothic look. Cripple Creek jasper, with its earthy shades and complicated internal designs, likewise produces striking cabochons for pendants and earrings and for masculine jewelry like cufflinks and belt buckles. A highly patterned area of the slab will make a stunning belt buckle, and jewelry pieces made from these jaspers can have a decided Western flair.

Cripple Creek, because of its impressionistic scenes, is the quintessential silicate for beautiful rock art, either for tabletop displays or fully framed wall pictures. Larger slabs can be given a pleasing polish with either a vibrating or oscillating flat lap, whereas small slabs can quickly be worked up with vertical disks attached to the ar-

bor of a cabbing machine. If the slab is fine sanded, then splendid results will be achieved within 30 minutes or less. Sometimes, medium-sized slabs sell for \$150, and even more if they are mounted in a customized or off-the-shelf picture frame.

Keep in mind that not every slab will be perfect, and although we are reticent to trim large slabs into smaller pieces for cabbing pendants and other jewelry, sometimes because of vugs and stress fractures this is the only viable option. Crafting utilitarian objects like refrigerator or whiteboard magnets, cabochons for pillboxes, inlays for jewelry boxes, business card holders, or even beverage coasters are some optional projects that the more adventurous craftsman may want to consider. Truly, the possibilities are endless and creative lapidaries will be shaping and polishing jasper from this windy ridge for decades to come. 💎

BENCH TIPS

Grinding and Sanding Large Cabs

With the girdle line well marked on the rough and the excess material trimmed off the slab, the first grinding step can begin. On the most common, newer all-diamond machines, the grinding and sanding wheels are quite close together, sometimes only $\frac{1}{2}$ inch apart. This doesn't allow enough room for working on cabs over about 2 inches across.

Recently, the lapidary instructor at the CFMS-sponsored classes at Camp Paradise demonstrated a modified wheel spacing on a Diamond Pacific Genie. He had acquired some extra spacers that for these machines. By removing the center wheel and replacing it with the extra spacers, he was able to get enough space between the wheels to effectively work on larger cabs.

My machine is a homemade one that I built about 35 years ago. I designed it with significant spacing between and around the grinding wheels and the expandable sanding drum. The machine utilizes 8-inch-diameter wheels. I also built it with extra space under the wheels. The largest cab I can make with it is 7 inches in the longest dimension. I have dreams of making a larger machine with a 4-inch by 10-inch Bull Wheel design for the sanding drum so I can do a better job of sanding the flat back and larger fronts of even larger cabs.

My machine has a large water container mounted above it with a valve attached to the outlet from the container. Special brass "bulkhead" fittings are installed above my wheels: two above each grinding wheel and three above the sanding wheel. They are designed to be mounted on a sheet-metal surface and can be found at most larger hardware stores.

There's a small plastic line from the supply valve that I move from one fitting to the next as I move between the wheels. Also, above both of the grinding wheels I have attached a scrap of denim that rides on the surface of the wheels. It saturates with water and spreads it across the wheels. The sides of the machine are low and I have built the front with a 1-inch lip so I can rest my hands and arms as I work.

Using a work lamp with a halogen light bulb, I can focus light on the girdle line that was previously drawn with the large template. The first wheel I use is a worn 100 grit sintered diamond wheel. (New sintered wheels are quite coarse; worn ones lessen

the chance that the preform will chip on the backside of the ground surface.)

I hold the preform in both hands and pay particular attention to keeping it at a 90° angle to the wheel so that the ground edge isn't slanted to the back or front. I stop and look at the edge from the side to ensure that it is perpendicular, and correct the angle anytime it deviates.

I grind up to the drawn girdle line but *never* beyond it. This is the line that defines the shape of the cab, and grinding past the line creates a deviation from the perfect oval. I keep this process going until I arrive at the starting point. At this time, I move to the finer-grit wheel (actually a very well-worn 100 grit wheel) and hold the preform in both hands perpendicular to the wheel. I rotate the preform front to back on the girdle edge to correct any possible deviations from perpendicular while smoothing over the coarser grinding marks. When I'm finished, I dry the preform and inspect this girdle line for any marks left from the coarser wheel, as well as any deviations.

I am now ready to draw the line around the girdle that will determine how far down the girdle I will grind the first bevel grind. I place the cab flat on my work surface and lay a ballpoint or aluminum pen on the work surface with the tip pointing at the girdle. I lift either the preform or the pen by placing various flat items under it until the pen is pointing directly at the middle of the girdle.

Exactly how high you make the mark is often a personal choice, but it may be determined by the thickness of the preform, how high you want the dome to be, or how you choose to design the girdle shape. Traditionally, I have shaped the girdle as a flat edge up to the halfway point and a low slope away from that edge to form the dome of the cab. Later in the process, I taper this flat edge slightly inward toward the center of the cab. This allows the bezel material to tip inward when the cab is set in a metal setting. Though these very large cabs most likely won't be put in any type of setting due to their size, I make the girdle in this shape out of habit.

I ensure that the girdle line is clear, thin, and well defined. This is another reference line that determines the overall shape of the cab. The slab that this particular cab came from was rather thin at $\frac{3}{32}$ inch (4.1 mm), so in order to get a higher dome that will reach all the way across the preform, I lowered the



Remove the center wheel and insert spacers to create enough space between the wheels for larger cabs.



Draw the line around the girdle that will determine how far down the girdle you will grind the first bevel grind.



Grind the first pass down to the girdle mark and into the front of the cab about $\frac{3}{8}$ inch.

grind line so that the girdle height would be .077 inch (1.97 mm) and the material for the dome would be .085 inch (2.16 mm).

The preform is now ready for the first shaping grind. Hold the preform in both hands and tilt the top edge against the wheel. I grind the first pass down to my girdle mark—but *never* beyond it—and into the front of the cab about $\frac{3}{8}$ inch. I continue grinding at this angle all the way around the preform, stopping frequently to ensure that I am keeping the grind at $\frac{3}{8}$ inch. I correct any deviations as I see them arise. For the next grinding pass, I tilt the bottom of the preform farther under the wheel and extend the width of the grind by $\frac{1}{4}$ inch for a total—so far—of $\frac{1}{2}$ inch.

The next step will be to continue the doming grinding. 💎

Bob Rush has worked in lapidary since 1958 and metal work and jewelry since 1972. He teaches at clubs and at Camp Paradise. Contact him at rocksbob@sbcglobal.net.



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MASTER INLAY ARTIST

JESSE MONONGYE

Hopi Tradition Influences His Award-Winning Work

Story and Photos by Bob Jones

In the November 1978 issue of *Rock & Gem*, I wrote about a young Hopi silversmith Jesse Monongye. Jesse's work had already been recognized as exceptional for a young craftsman.

Jesse was born in the Grand Canyon, where he was steeped in the traditions of the Hopi people. He started his craft in 1977 by taking a high-school class in silversmithing, which he actually flunked! Shortly afterward, he entered seven pieces of his artistic jewelry in the biggest Indian art show in Gallup, New Mexico. His work took five blue ribbons! That's exceptional for a fellow who had started his craft just a year before.

Hopi tradition is still a major part of his work, but he has also incorporated his free spirit, resulting in some of the most creative and artistic jewelry designs you will ever see. Ironically, that free spirit was one reason he failed that silversmithing class. The use of the Sun God image is prominent in Jesse's work. The Sun God is the most important symbol in Hopi tradition and religion. The sun is the most dominant force on the reservation, so it is always incorporated into jewelry when possible. The Sun God symbol should always be crafted after sunset, a tradition Jesse honors. Another tradition is to incorporate a space between Hopi and Navajo nations.

Over the years, his jewelry has won awards at countless events, and some is on permanent display in the world-famous, private Heard Museum in Phoenix, Arizona. I'm sure that high-school teacher would be impressed with Jesse's work now.



Jesse uses lapis for a background to highlight the gem ornamentation on this bear bola tie ornament.



Earth and sky, two important elements of the Hopi religion, are represented in gems on this bola tie ornament.



Students look on with rapt attention as Jesse Monongye demonstrates the techniques for creating superb gemstone inlay work.

I had enjoyed writing about Jesse over 35 years ago because, unlike some craftsman, he was willing to share his methods and techniques with *Rock & Gem* readers, hoping to encourage more people to get into the hobby. Jesse has never stopped sharing his expertise with other artists, young and old. He created the Scottsdale Artist School, where he teaches small educational classes, and is a leader in Hopi design in the Southwest, admired by his peers.

Eager students come from far away to learn from the master. When I visited his class in 2014, there were students from Scottsdale and Carefree, Arizona, New Mexico, California, the Bronx, Montana, and Nanton and the Blackfoot Reservation in Alberta. Because of our long friendship, Jesse had invited me to visit his studio, where his class of a dozen students was completing a program on Jesse's techniques. Their finished work was quite amazing considering most were just beginners.

They were well along in creating fine bracelets inlaid with a variety of colorful gemstones. These bracelets are symbolic of the prayer stick, a very significant item



Combining gold with bright-red coral and colorful gems, Jesse created this radically designed bracelet.

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During his class, Jesse offers advice and training to his hard-working students.

in traditional Hopi religious rituals. Prayer sticks are carried by kachina dancers, who serve as a physical representation of natural or supernatural spirits, or kachinas, in the rituals. The tribespeople venerate and petition the kachinas for favorable weather, protection, fertility, and innumerable other earthly benefits.

Traditional prayer sticks are colorfully banded, and this is emulated in Jesse's bracelets, which are inlaid with a host of colorful gemstones. Jesse had his students start their bracelets with a cast design that was to be inlaid with gemstones like coral, malachite, onyx, opal, lapis, charoite and jasper. I was able to examine many of the finished bracelets and I was impressed by their quality. The bracelets were very well done, each gemstone fitting tightly against the gemstone next to it. This was proof that the students had listened and learned how to grind stones so the joins between them were virtually invisible.

Jesse was very insistent as he taught his students how to achieve such seamless inlay work. Starting with a small, square piece of coral, Jesse demonstrated repeatedly how to grind the fragment of gem. Using a 100 grit wheel and holding the piece perfectly level just above the center of the spinning disk, he shaped the piece. As he ground it, he checked it again and again, carefully removing only a little of the gem at a time. Keep in mind that each piece he worked with only measured 1 mm or 2 mm thick, a sure way to lose skin on his fingertips. He continually pointed out that the piece had to have a straight top edge, so that when it was fitted next to another stone in the metal piece, the line between the two pieces was exactly straight and hardly visible.

This is normal, but Jesse has a way of obscuring even that thin line. The inlay pieces extend about the surrounding metal. With later gentle grinding and polishing, the

gems will actually fill in that hair-thin line so it virtually disappears.

Grinding a small fragment of gem on a wheel actually has an advantage for the artist. By holding the stone just above the centerline of the curved wheel, you let the curvature of the wheel just below your horizontal position slightly undercut the piece. This is critical to fitting your piece in the metal bracelet form. If the sides were perfectly straight, the fit would be very difficult, but with the sides of the piece slightly tapered, the wedge-shaped piece will slide in neatly. Each side of the piece is ground that way. You can see the advantage of that taper when you fit your piece into the metal bracelet. The piece will slip ever so neatly into its assigned spot.

Another trick Jesse was teaching his students was how to make a perfectly round gem that would fit into small holes drilled into a piece. These small holes represent a Hopi tradition that Jesse incorporates especially into sky patterns.

Jesse demonstrated how to create a perfect circle from a piece of rough. He starts by squaring off a thin piece of gemstone an inch or more long. Again, the piece is held horizontal to the face of the grinding wheel, then is slowly rotated to gradually round the sharp corners. As the rounded shape begins to appear, Jesse "twirls" the piece quickly as he holds it against the grinding wheel. This achieves the rounding effect he wants, but often takes a bit of skin from his fingers, as well.

As the long piece is rounded, he checks the end of it against the drilled hole until he has a perfect fit. Then he cuts the rounded rod into very short bits that are just slightly taller than the depth of the drilled hole. Once inserted, the piece is ground and polished, causing any visible boundary line to almost disappear, as before.

This simple explanation gives you the (totally correct) idea that making perfect inlay



Setting a carefully shaped gem in a bracelet casting takes both skill and patience.

jewelry takes time—lots of time. Jesse doesn't care because speed is not his goal. He constantly impressed on his students that care and patience are the keys to a good result. If it takes 100 hours or longer to do one piece, so be it. Perfection is the goal of any master inlay artist and a level Jesse achieves in all his work. Proof of this is the high esteem in which Jesse is held by other artists.

I learned many things listening to Jesse as he instructed his students. One thing I did not know had to do with the direction in which you cut a stone. If you cut a piece in different directions, the resulting sections of the stone will have slightly different shades of color. Jesse emphasized that, when cutting a piece into several sections, you should always cut in the same direction. This gives you a better chance of having evenly colored, matching pieces.

Once you have cut your pieces and ground them to fit into a casting or bezel, how do you mount each piece? Jesse discussed at length how he discovered Superglue® when he was just beginning to do inlay work. He showed the proper way to apply just a tiny drop of Superglue to a tiny bit of stone measuring only a couple of millimeters. He chuckled as he related his first experience with Superglue, when he managed to glue a couple of his fingers together. A little acetone helped free up his digits.

As Jesse concluded his day's session, he commented again on the array of grinding machines in his studio. He had added lights and a larger water pump to each, so the tiny pieces, which are prone to fracture, are kept cool. Then he reminded his students that the quality and beauty of the final product depends mainly on patience and care, not time. Perfection of work, he said, is far more important than the time you spend on a piece. Never be satisfied with anything but perfect, for that will develop your expertise in lapidary work. ♦



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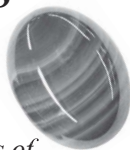
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ROCK SCIENCE

by Steve Voynick

The Mysteries of Manganese

Mineral collectors are most familiar with manganese as the chromophoric element that creates the bright-red color of rhodochrosite (manganese carbonate), the rich pink of rhodonite (manganese silicate), and the delicate pink of manganoan calcite (manganese-rich calcium carbonate). Traces of manganese also cause the reddish highlights in fine specimens of the amethyst variety of quartz.

But manganese creates reddish colors only in its +2 oxidation state. While manganese actually has five common oxidation states, most of the manganese in the earth's crust occurs in the +4 state, which creates a black color.

The most abundant manganese-bearing mineral, and the primary ore of manganese, is pyrolusite (manganese dioxide). Pyrolusite has a Mohs hardness of 6.0 and a specific gravity of 4.4-5.0. It in the tetragonal crystal system, although it rarely forms crystals. Most pyrolusite occurs in earthy, powdery and granular forms, or as botryoidal masses. Pyrolusite's color, like that of all minerals containing manganese in the +4 oxidation state, is black. Its luster is dull to semimetallic.

Pyrolusite almost always occurs with such closely related minerals as manganite (hydrous manganese oxide) and nsutite (basic manganese oxide), which can be differentiated only by laboratory analysis. A formerly recognized manganese mineral called "psilomelane" was discredited in 1982, when mineralogists realized that it was actually an indeterminate mix of pyrolusite and other manganese oxides.

If manganese oxides are unfamiliar to collectors, so, too, is manganese itself. Manganese, the 12th most abundant element in the earth's crust, is a brittle, silvery-gray metal with a specific gravity of 7.2 and a Mohs hardness of 6.0—physical properties that are generally similar to those of iron.

The affinity of manganese for iron accounts for its greatest use—as an alloying agent in steelmaking. Iron and manganese both crystallize in the cubic system and have almost identical ionic radii, enabling them to readily form solid solutions. Manganese makes two important contributions to manganese-steel alloys.

Because it is more chemically reactive than iron, manganese bonds with the free oxygen and sulfur that are usually present in iron and would compromise the strength of the steel. Furthermore, manganese enhances iron's ability to take on the desirable qualities



This botryoidal manganese ore consists primarily of the mineral pyrolusite, or manganese dioxide.

of such other alloying metals as molybdenum, vanadium, nickel and chromium.

About 90% of all manganese is used in structural steel and stainless steel alloys. Most steels contain only about 1% manganese. High-manganese steels, containing 12% manganese or more, have a remarkably high tensile strength and are used to manufacture safes, bank vaults, and military armor. Beverage-can alloys also contain about 1% manganese to prevent electrolytic corrosion.

Manganese is obtained by mining pyrolusite and associated manganese-oxide minerals from small, but rich, replacement and vein-type deposits. Ores usually contain about 0.3% manganese. The 46 million tons of manganese ore that are mined globally each year yield 15 million tons of manganese. Manganese ores, which require no concentration before smelting, are worth about \$8 per ton. China accounts for one-third of world production, followed by South Africa, Australia and Gabon. The United States relies entirely upon foreign sources for its manganese requirements.

Pyrolusite is collected for its prominent botryoidal habit. Masses of botryoidal pyrolusite with individual botryoidal structures larger than an inch make unusual and interesting display pieces.

While most of us never see metallic manganese, this abundant element is always close by in structural steel, stainless steel, aluminum beverage cans, and specimens of red rhodochrosite and black pyrolusite. ♦

Steve Voynick is a science writer, mineral collector, former hardrock miner, and the author of books like *Colorado Rockhounding* and *New Mexico Rockhounding*.



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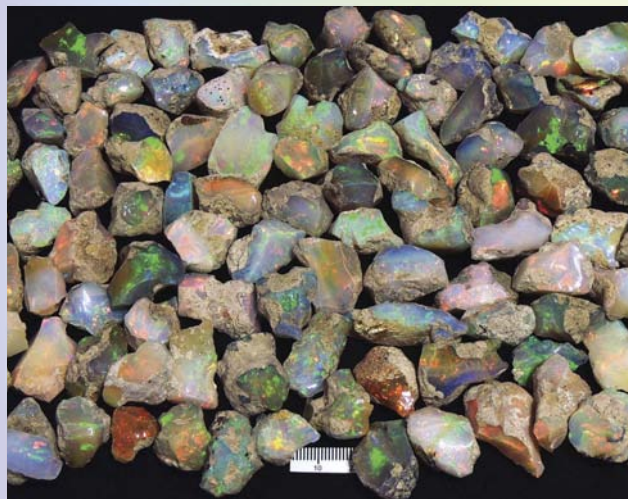
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The Natural History Museum of Utah

See the Gems, Minerals and Fossils
of the Beehive State

Story and Photos by Steve Voynick

As a source of minerals,
gemstones and fossils,
Utah is hard to beat.

Well known for fine specimens
of such unusual minerals as red
beryl, variscite, topaz and bixby-
ite, the Beehive State is also the
world's premier source of such
fossils as those of the large, car-
nivorous dinosaur *Allosaurus*.

The abundance and variety of minerals
and fossils in Utah is due to complex geol-
ogy that has created three distinctly differ-
ent physiographic regions within the state:
the Colorado Plateau in the southeast; the
Middle Rocky Mountains in the northeast;
and the basin-and-range country of the
Great Basin in the west. And Utah is a big
state, so seeing the highlights of what it has
to offer in minerals and fossils can take a lot
of time—unless you visit the Natural His-
tory Museum of Utah (NHMU).

Located on the University of Utah cam-
pus in Salt Lake City, the NHMU recently
moved into a newly built facility in the
Rio Tinto Center, near the foothills of the
Wasatch Mountains. Built on hillside terrac-
es, the multilevel Rio Tinto Center encloses
163,000 square feet, one third of which is
public gallery space.

The museum's architecture is symbolic
of some of Utah's most recognizable topog-
raphy. Much of the exterior is covered with
42,000 square feet of reddish-colored cop-
per sheathing in horizontal bands of vary-
ing heights that represent the cliffs, canyon
walls, and other stratified, sedimentary
rock formations that characterize Utah's
Colorado Plateau country. The copper
in the sheathing was mined at Kennecott
Utah Copper Corp.'s Bingham Canyon



This superb, 10-inch, cut and polished half nodule of variscite from Utah's Clay Canyon has a deep green color and a rind and veining of yellow crandallite.



This 12-foot-high wall display in NHMU's O.C. Tanner Hall of Gems and Minerals showcases 43 of the museum's finest Utah specimens.



In November 2011, NHMU moved into the newly built Rio Tinto Center on the campus of the University of Utah in Salt Lake City.

mine, 25 miles to the southwest across the Salt Lake Valley, which is visible from the museum. The new museum building is named for Rio Tinto, the multinational mining giant and corporate parent of Kennecott Utah Copper.

The roots of NHMU go back to 1959, when a University of Utah faculty committee decided to consolidate the various natural-history collections that were on exhibit around the campus. The museum was formally established as the Utah Museum of Natural History by an act of the Utah legislature in 1963. This original museum, housed in a former University of Utah campus library building, opened to the public in 1969. By 2006, the museum was running out of room for its rapidly expanding collections and began planning for, and constructing, a new facility. Six years later, in November 2011, the museum moved into the Rio Tinto Center.

Today, NHMU has 10 themed exhibition galleries, all with a Utah focus. Rockhounds, mineral collectors, and amateur paleontologists will be especially interested in two of these galleries: the O.C. Tanner Hall of Gems and Minerals and the George S. and Dolores Doré Eccles Foundation Gallery, which houses the "Past Worlds" paleontological exhibits.

The O.C. Tanner Hall of Gems and Minerals is named for Obert Clark Tanner (1904-93), a University of Utah professor of philosophy, the founder of a highly successful jewelry company, and a leading Utah philanthropist. The hall displays more than 260 mineral specimens, the majority of which are from Utah. The finest of these Utah specimens occupy a 12-foot-high wall display.



In NHMU's George S. and Dolores Doré Eccles Foundation Past Worlds exhibition, a descending "walkway through time" provides interesting and unusual views of 30 skeletal mounts.

Many of the Utah specimens are from the private collection of Utah geologist and mineral collector Alfred M. Buranek (1915-87). In the 1970s, Buranek sold his collection, then valued at \$750,000, to Utah businessman Merlin J. Norton, who later donated it to the museum. Most of the Buranek specimens are historically significant and were collected at mines and other localities that have long since closed.

One particularly eye-catching specimen in the Utah display is a superb, 10-inch variscite from the classic and now-closed Clay Canyon locality near Fairfield (Utah

County), some 30 miles south of Salt Lake City. Utah is the source of the world's finest variscite, a hydrous aluminum phosphate that forms as a secondary mineral when phosphate-rich solutions react with aluminum-rich rocks in shallow, acidic environments. This particular specimen is a cut-and-polished half nodule with a deep-green color, and a yellow rind and internal veining of crandallite, a related phosphate mineral that is frequently associated with Utah variscite. The Clay Canyon deposit was discovered in the 1890s and yielded its best specimens in the 1930s.



This 6-inch group of azurite crystals in an unusual, long, prismatic habit is from the Bullion Beck mine, one of Tintic's largest mines.

Another attractive specimen is a variety of calcite that has been found only in Utah: "honeycomb" calcite from a quarry in the Uinta Mountains near Hanna, in northeastern Utah's Duchesne County. Honeycomb calcite is translucent and has a bright, rich, honey-yellow-to-golden-amber color that varies with the thickness of the stone. Its unique color is caused by particles of elemental sulfur that are included within the calcite. Honeycomb calcite, which consists

of bundles of long, fibrous, yellow-amber calcite crystals—each bundle sheathed in a white calcite rind—exhibits its namesake honeycomb appearance when cut and polished.

Also known as "amber onyx", honeycomb calcite is mined commercially and fashioned into distinctive decorative items such as candleholders that glow when illuminated internally by a candle flame or an artificial light source. The superb, 10-inch specimen at NHMU was donated by Rick Dalrymple of Salt Lake City's Rockpick Legend rock shop.

Utah is also the source of the world's finest bixbyite, a manganese iron oxide that crystallizes in the isometric system as small, well-developed cubes. This rare mineral was discovered in the Thomas Range (Juab County) in 1897 by Utah mineral dealer and prospector Maynard Bixby, and was named in his honor. It is opaque and black, has a bright, metallic-to-submetallic luster, and occurs almost exclusively in rhyolitic cavities. The exceptional specimen displayed in the O.C. Tanner Hall of Gems and Minerals consists of two lustrous, 1/2-inch, beveled cubes of bixbyite on an off-white rhyolite matrix.

Bixby is also credited with another major Utah discovery: beryllium aluminum silicate, the rare, red variety of beryl. After Bixby found red beryl in the Thomas Range in 1904, mineralogists recognized it as a previously unknown beryl variety. Red beryl forms only under very specific conditions within rhyolitic lava. As newly formed

rhyolite contracts, beryllium-rich gases migrate upward through fissures. Near the surface, these gases react with silica-rich groundwater, aluminum-rich feldspar minerals, and such iron-manganese-oxide minerals as bixbyite to form red beryl crystals. The rich, raspberry-red color of the crystals is caused by traces of manganese, iron and chromium.

Red beryl crystals are rarely longer than 1/3 inch, but the specimen at NHMU is a sharp-edged, flatly terminated, 3/4-inch-long, hexagonal crystal from the Wah Wah Mountains (Beaver County) in southwestern Utah. The Wah Wah Mountains are one of only three localities worldwide in which red beryl is known to occur. The other two are Utah's Thomas Range and New Mexico's Black Mountains.

However, the Wah Wah Mountains are the only source of gem-quality red beryl. Since gem-quality material was found there in 1958, it has been mined commercially. Gem-quality red beryl, also known as "red emerald" and "scarlet emerald", is one of the most costly of all gems. Faceted red beryl gems of just 2 carats have sold for over \$6,000.

The Thomas Range is also a classic American source of topaz, one of the most widely collected of all Utah minerals. Topaz occurs in the same rhyolitic environment as red beryl and bixbyite. In 1854, a geologist accompanying a U.S. Army survey party discovered topaz in the Thomas Range at what is now Topaz Mountain. In 1884, specimens were sent to George Frederick Kunz, America's first true gemologist, who described them as gem quality.

Bixby, of bixbyite and red beryl fame, also collected at Topaz Mountain in the 1890s and staked several topaz claims that are still known today as the "Maynard Claims".

Some of the finest examples of Utah topaz were found in 1973 by John Holfert, then a University of Utah graduate student who was conducting fieldwork for his master's thesis in geology on Thomas Range minerals. Holfert, who went on to collect exceptional topaz crystals for many years, is now a University of Utah professor and an authority who has written extensively on Topaz Mountain minerals.

In NHMU's display of Utah minerals, Thomas Range topaz is represented by a beautiful, 1-inch-long, gem-quality topaz prism in rhyolite matrix. Topaz Mountain is still a popular site today among both amateur and commercial mineral collectors.

Another interesting specimen in the Utah display is a 5-inch cluster of bright-yellow sulfur crystals from Sulphurdale in Beaver County. Now a ghost town, Sulphurdale provided the nation's entire supply of elemental sulfur in the late 1800s, shipping



One of the newest NHMU displays is this skeletal mount of *Deinosuchus hatcheri*, a 30-foot-long, alligator-type creature with a 6-foot-long skull and a back covered with tough, armored plates.

about 1,000 tons per year. The shallow sulfur deposit in this geothermally active area formed through condensation and reduction of rising hydrogen sulfide gas.

The 750-foot-long, 150-foot-wide deposit consists of veins and masses of elemental sulfur in a mix of gravel, low-grade limestone, and gypsum. The ore graded at least 15% sulfur. After being ground, the sulfur was separated by hydraulic washing. Sulfur mining ended in the 1950s. Today, Sulphurdale is the site of a small geothermal power facility that generates electricity.

No collection of Utah minerals would be complete without specimens from Park City, which is situated at an elevation of 7,000 feet in Summit County, 32 miles east of Salt Lake City. In the 1880s, Park City, which lies atop an extensive network of mineralized quartz veins and replacement deposits, was one of the world's richest silver camps. During decades of operation, the Ontario mine, one of Park City's leading mines, produced 50,000 troy ounces of gold, 50 million troy ounces of silver, 2 million pounds of lead, 26 million pounds of zinc, and 4.7 million pounds of copper, all with a year-mined value of more than \$500 million. When its last mines closed in the 1960s, Park City began a successful economic transition to year-round outdoor recreation and tourism, and went on to become a venue for the 2002 Winter Olympic Games.

Among the Park City specimens in the O.C. Tanner Hall of Gems and Minerals is a beautiful, 5-inch cluster of gleaming, perfectly formed pyrite crystals, with individual dodecahedrons measuring about 2 inches. Another Park City specimen is a beautiful, 6-inch spray of terminated milky-quartz crystals on matrix.

The Tintic Mining District in Juab County, 60 miles south of Salt Lake City, is a multi-metal district that actually surpassed the value of Park City's cumulative production. The discovery of silver at Tintic in 1865 triggered a major rush. A half-dozen towns, including Eureka, Mammoth, and Silver City, housed the miners who worked eight major replacement and vein-type ore bodies.

Tintic's mineralization is unusually complex and diverse. The district has yielded many rare species and is the type locality for six minerals. The primary ore minerals were galena, sphalerite, enargite, tetrahedrite, pyrite, marcasite, a number of telluride minerals, and native gold, silver and copper. By the time its last mines closed in the 1970s, Tintic had produced 250 million troy ounces (10,400 tons) of silver, 2.6 million troy ounces of gold, 300,000 tons of copper and zinc, and more than 1 million tons of lead. Its total year-mined value exceeded \$600 million.



Dromaeosaurids were small, but fast, feathered carnivores with slashing claws. This 6-foot-long skeletal mount resides in the George S. and Dolores Doré Eccles Foundation fossil gallery.

The NHMU has two Tintic specimens on display. One is a cluster of 3-inch, spear-shaped prisms of white aragonite; the other is a 6-inch group of azurite crystals in an unusual long, prismatic habit from the Bullion Beck mine, one of the district's richest mines.

The largest specimen of a Utah mineral on display at the museum is a 3-foot-long, light-honey-colored, "fishtail" crystal of the selenite variety of gypsum that is a

textbook example of twinning. The crystal was collected near the northeast corner of Capitol Reef National Park in south-central Utah's Wayne County—an area known for monoliths and mounds that consist largely of gypsum.

This gypsum was deposited by evaporating seawater. After burial, the gypsum's very low density enabled it to rise through overlying sediments and recrystallize near the surface in the form of selenite. Subsequent



"Honeycomb" calcite from a quarry in Utah's Duchesne County owes its bright color to included particles of elemental sulfur; its "honeycomb" appearance is due to bundles of long, fibrous, yellow-amber calcite crystals, each sheathed in a rind of white calcite.



This 6-foot-long skull of *Nasutoceratops titusi* in NHMU's paleontological research collection was recovered in 2006 at Grand Staircase-Escalante National Monument.



NHMU's paleobotanical displays include this exquisitely detailed, 6-inch, 50 million-year-old, Eocene leaf and flower fossil from the Green River sediments (Uintah County).

erosion of the host sandstone exposed the selenite-rich monoliths and mounds.

Another interesting specimen in the O.C. Tanner Hall of Gems and Minerals is celestine, or strontium sulfate, that was collected in south-central Utah's Emery County. This 5-inch section of a celestine-lined geode formed in the sediments of the San Rafael Swell, a 75-mile-long, 40-mile-wide geological anticline that was thrust upward by the tectonic stresses that created the Rocky Mountains. Much like the gypsum-rich solutions that created the monoliths and mounds of Wayne County, strontium-rich solution rose through sediments to form the celestine-lined geodes of the San Rafael Swell.

Other notable Utah specimens on display include an unusual, botryoidal azurite on a greenish-yellow matrix of malachite and hematite from the Blue Crystal mine in San Juan County and a green aurichalcite from the Hidden Treasure mine in Tooele County. Visitors can also explore a walk-in replica of a typical, underground Park City silver mine of the late 1800s.

Utah is among the world's great sources of vertebrate fossils, many of which are showcased in NHMU's George S. and Dolores Doré Eccles Foundation Gallery. This gallery was funded by and named for philanthropists George and Dolores Eccles of the Utah-based Eccles banking empire that was founded in the 1890s. The museum's paleontology collection includes 20,000 specimens of vertebrate fossils, 5,000 pa-

leobotanical fossils, and 2,000 invertebrate fossils. The gallery features innovative, descending "walkways through time" that offer interesting and unusual views of the skeletal mounts on display.

The Beehive State is home to three world-class sources of vertebrate fossils: Dinosaur National Monument near Vernal (Uintah County) in northeast Utah; the Cleveland-Lloyd Dinosaur Quarry (Emery County) in east-central Utah; and Grand Staircase-Escalante National Monument in southern Utah. University of Utah paleontologists have played particularly important roles in exploration and fossil recovery at Cleveland-Lloyd and Grand Staircase-Escalante.

Many of the museum's skeletal mounts are from the Cleveland-Lloyd Dinosaur Quarry, one of the nation's richest concentrations of fossilized dinosaur bones. The quarry is named for its proximity to the tiny town of Cleveland and for Malcolm Lloyd Jr., a Philadelphia attorney who financed the early excavations. University of Utah scientists began collecting there in 1927, and within a decade had recovered more than 2,000 bones. Although the quarry was not worked again until 1960, it has since yielded more than 12,000 fossil bones and one fossil dinosaur egg.

Skeletal mounts reproduced from Cleveland-Lloyd fossils are exhibited in 65 museums worldwide, including NHMU and three other Utah museums. Most of the original bones are part of the University of Utah collection.

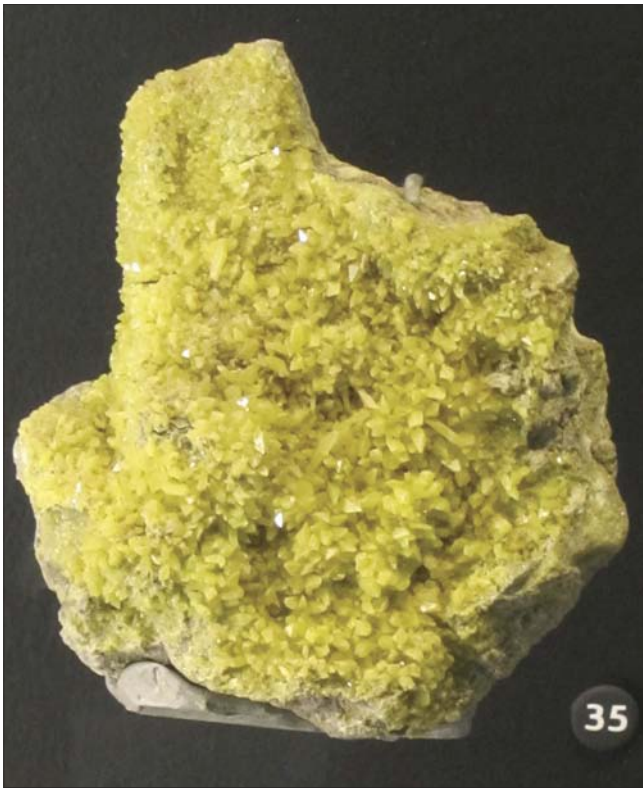
The Cleveland-Lloyd quarry is the world's primary source of the fossilized bones of *Allosaurus*, the quintessential Jurassic carnivorous dinosaur and Utah's state fossil. Two-thirds of the bones from this quarry are from *Allosaurus*. Other fossilized bones include those of *Stegosaurus* and *Camarasaurus*.

The quarry site, located at the end of a graded road 30 miles south of Price, is administered by the federal Bureau of Land Management. In 1969, the BLM opened a visitor center at the quarry, the first such BLM center ever established. In 2007, the bureau built a larger and improved visitor center with updated and expanded exhibits that include a complete skeletal reconstruction of *Allosaurus* and a *Stegosaurus* wall mount.

NHMU has the world's most extensive collection of *Allosaurus* fossils, with individual specimens ranging from 3-foot-long hatchlings to 35-foot-long adults. Among the museum's most striking displays is a complete skeletal mount of an adult *Allosaurus fragilis*.

Several skeletal mounts at NHMU are casts of fossils that were only recently recovered at Grand Staircase-Escalante National Monument. Unlike the Jurassic fossils of Dinosaur National Monument and the Cleveland-Lloyd quarry, fossils from Grand Staircase-Escalante are about 75 million years old and represent life in the more recent late Cretaceous Period.

Although the first major fossil discoveries at Grand Staircase-Escalante were only



This 5-inch cluster of bright-yellow sulfur crystals is from Sulphurdale in Beaver County, a locality that was once the nation's leading source of elemental sulfur.



NHMU has a glass-enclosed fossil preparation lab where museum visitors can watch paleontologists and preparators at work.

made in 2002, paleontologists already consider the site to be the last great, largely unexplored “boneyard” in the lower 48 states. The first recovered bones were those of a 30-foot-long *Gryposaurus*, a duck-billed dinosaur whose jaws held as many as 800 teeth.

Also recovered were the remains of a *Hagryphus*, a 7-foot-tall, birdlike, carnivorous dinosaur that may have been feathered. Other recoveries include dome-headed dinosaurs; armored dinosaurs; sickle-clawed relatives of *Velociraptor* (the speedy predator in the movie “*Jurassic Park*”); and several previously unknown horned dinosaurs, including a rhinoceros-sized relative of *Triceratops* with a skull decorated with no fewer than 15 horns.

A recent recovery at Grand Staircase-Escalante National Monument was the remains of *Deinosuchus hatcheri*, a 30-foot-long, alligator-type creature with a 6-foot-long skull and a back covered with tough, armored plates. NHMU displays a full skeletal mount of *Deinosuchus*, along with full mounts of *Gryposaurus* and *Hagryphus*.

One of the most photographed exhibits in the Eccles gallery is the “Ceratopsian Wall”—a side-by-side display of 14 different *Ceratops* skull casts that show the wild variations in the number, size and shape of their horns. NHMU also has a glass-enclosed fossil preparation lab where museum visitors can watch paleontologists and preparators at work.



One of the most photographed exhibits in NHMU's Past Worlds gallery is the “Ceratopsian Wall”—a side-by-side display of 14 *Ceratops* skull casts that show wild variations in the number, size and shape of horns.

While the Natural History Museum of Utah offers wonderful exhibits on minerals and fossils, visitors will also enjoy many other fine exhibits on Utah's geology, physiograph-

ic provinces, biological diversity, and Native American cultures, and the Great Salt Lake.

For information on exhibits and hours, visit www.nhmu.utah.edu. 💎



Reduce Toxicity in the Workshop

Part 1: Flux and Pickle Alternatives



Whether you are a rockhound who dabbles in jewelry making or an experienced bench jeweler with expertise in precious gems, procedures and working methods that ensure your health and safety are the cornerstones of a long career. To reduce risk, minimize exposure to harmful substances by substituting less harmful alternatives, using personal protective equipment, installing adequate ventilation, and limiting the time and frequency of exposure.

Identifying hazardous chemicals and practices in the studio is the first step in creating a safer working environment. Once a hazard has been identified, eliminate the process whenever possible or substitute a less-toxic or less hazardous alternative. Products commonly used in the jewelry studio, such as flux, pickle and oxidizers, often contain chemicals that are hazardous to your health.

Fluxes often contain fluoride or chemicals in the fluoride family. Fluoride reduces

the melting temperature of flux, making it flow readily at the temperatures required for soldering. However, breathing fluoride fumes is toxic. While health and safety issues are very important, other factors such as the working properties and cost must also be considered.

BORAX CONE

The major benefits of the traditional borax cone are that it does not emit any toxic fumes and it is currently one of the

most economical options on the market. For those who have grown accustomed to the simplicity of opening a jar of liquid or paste flux, using the borax cone may take some getting used to. When using a borax cone, the pointed end of the solid, cone-shaped cake is held in the hand, while the wider end rests in an abrasive ceramic dish or on a granite slab. Add water to the dish or slab and grind the cone against it to create a paste of the desired consistency. The paste will dry out between uses. Add water to thin or reconstitute the paste.

During soldering, the flux flows well at the viscosity temperature of 1370°F. With proper storage and handling, the cone will serve for many years of use. Health hazards are minimal, but this product can be a mild irritant to the skin and eyes. To prevent sensitivity, use with safety glasses and gloves or barrier cream.

FIRESCOFF®

Firescoff has many benefits, including no fluorides, no odor, no outgassing, and no health hazards with normal use. No pickling is required, and the alcohol-free formula also acts as a firescale preventative. To use, the piece is warmed and the entire surface is coated with the product, applied by spray or brush. The spray simplifies application and saves time, but uses more of the product. Firescoff can be removed either with hot water or in two minutes with an ultrasonic. No safety equipment is required with normal use.



The traditional borax cone does not emit toxic fumes and is one of the most economical flux options.

The many benefits of this product must be weighed against the fact that the quantity of the product required for the spray application and the cost make Firescoff one of the more expensive options on the market. Regardless, the cost is not exorbitant, and one must consider the value of one's health and safety.

HANDY® FLUX

Handy Flux is designed to flow easily at the viscosity temperature of 1100°F and can be removed with warm water. The easy-to-use, easy-flow paste formula contains two chemicals—potassium fluoride and potassium bi-fluoride—that enable the product to flow at such low temperatures. Both chemicals are very hazardous in case of skin contact (irritant), eye contact (irritant), ingestion and inhalation.

Do not breathe the fumes of this product during soldering. Use only with adequate ventilation and/or a chemical respirator. Safety goggles and gloves or barrier cream are also recommended.

PICKLE

Chemical pickle solutions can cause health problems with overexposure. According to Material Safety Data Sheets (MSDS), sodium bisulfate, the chemical in most standard pickling solutions, is hazardous in cases of skin and eye contact and inhalation. Take measures to reduce exposure and substitute less toxic alternatives for your health and to reduce environmental impact. Several less-toxic pickle solutions can be readily substituted.

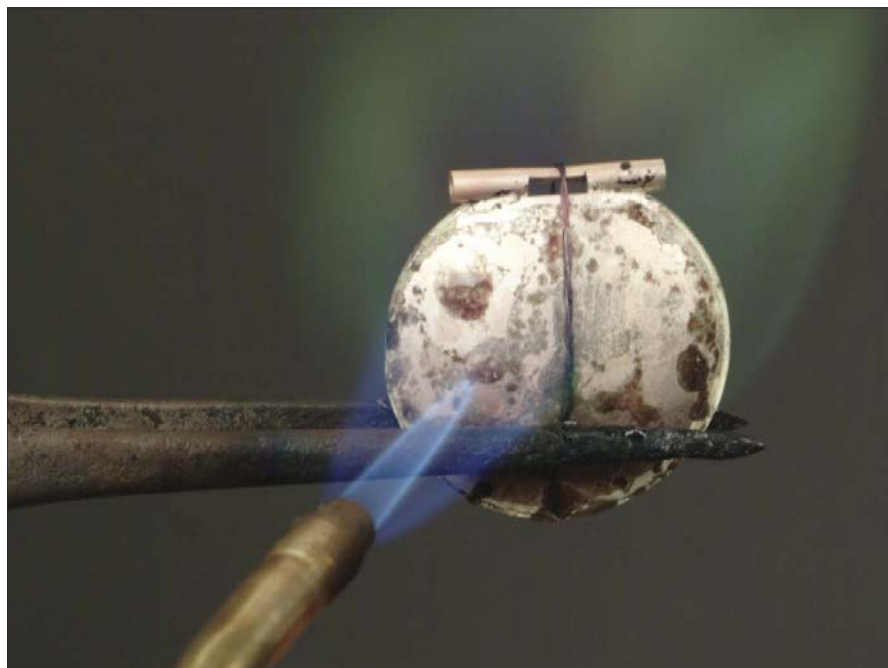
WHITE VINEGAR

White vinegar is an inexpensive, readily available, biodegradable food-grade acid. Use it full strength, warmed in a traditional pickle pot, to remove flux and oxides. White vinegar works with all non-ferrous metals and is recommended for use with Argentium®.

Though vinegar is a food-grade acid, it may cause mild irritation to the skin, eyes, and respiratory tract. To prevent sensitivity, gloves, safety glasses, and adequate ventilation are recommended. This pickle solution has a slightly pungent odor.

CITRIC ACID

Citric acid is a natural acid that can be obtained in powder form and is commonly used in preserving food. Citric pickle doesn't cause copper plating when it comes into contact with steel. It is gentler than a standard pickle solution and does not emit odors. Mix 1 or 2 tsp per cup of water (always add acid to water) and warm it in a traditional pickle pot to remove flux and oxides. Citric pickle may take a bit longer than the traditional pickle solution. In that case, increase the strength of the solution to



Fluoride makes flux flow readily at soldering temperatures, but breathing fluoride fumes is toxic.

reduce cleaning time. Citric acid may cause mild irritation with skin or eye contact. Safety goggles, gloves or barrier cream, and adequate ventilation are recommended.

REDUCE PICKLE CONSUMPTION

For most jewelers, the volume of pickle required is very small. Try using a small (2- to 3-cup) pickle pot to reduce your chemical use.

Reduce the amount of chemicals you use by making your pickle solution last. To keep the solution strong, avoid introducing baking soda. Rinse tongs, baskets and jewelry in a neutralizing bath before returning them to the pickle. As water evaporates, add more water. If the pickle is weak, add more acid. Strain the pickle solution through a coffee filter to remove particles and debris. With care, a pickle solution can be used for many months—up to a year—before it needs replacing.

FOLLOW DISPOSAL PROCEDURES

Pickle is used to remove flux and oxides (generally copper oxides) from the surface of the precious metals used in jewelry making. Therefore, all used pickle has copper ions suspended in the solution. Copper is one of the heavy metals, which are harmful to plants and animals, and it is against regulations in California, Rhode Island, and Louisiana to put it down the drain. All spent pickle—even biodegradable and/or neutralized solutions—must be disposed of properly.

With all less-toxic alternatives, be sure to read the MSDS, use proper ventilation, and follow all safety and disposal procedures. Hazardous waste disposal procedures vary by region. Check with local government and sanitation agencies for information. ♦



Firescoff contains no fluorides, is odorless, and presents no health hazards with normal use.

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Show Dates from page 10

Fri. 9-5, Sat. 9-5, Sun. 10-5; Admission \$1, Children 12 and under Free; contact Walt Butler, PO Box 641, Forest Grove, OR 97116; e-mail: Walterbutler@comcast.net

13-15—FOREST HILL, TEXAS: Annual show; Exhibit Group International, City of Forest Hill Grand Ball Room; 3219 California Parkway; Fri. 11:00 am-6:00 pm, Sat. 10:00 am-6:00 pm, Sun. 10:00 am-5:00 pm; Adults \$3.00, Children Free; Fine Jewelry gold and diamond, fine jade selection, large choice of gem, beads and mineral stone, finding & petwer supplies, beading class, fashion jewe lry and gift more.; contact John su, 13337 South Street #633, cerritos, CA 90703, (714) 494-4546; e-mail: eg168@hotmail.com; Web site: www.egishows.com

14-14—SKOKIE, ILLINOIS: 66th Annual Silent Auction; Chicago Rocks & Minerals Society, St. Peter's United Church of Christ gymnasium; 8013 Laramie Ave. (across the street from the public library on Oakton); Sat. 6 p.m.-9 p.m.; Admission is Free; Bring the entire family. Rockhounds of all ages bid on rocks, crystals, minerals, fossils, handmade jewelry, lapidary treasures, books, magazines and more to add to their collections. Doors open to the public at 6 p.m.; first table closes at 6:30 p.m. Children must be accompanied by an adult. Free admission and parking.; contact Jeanine N. Mielecki, (773) 774-2054; e-mail: jaynine9@aol.com; Web site: www.chicagorocks.org

14-15—FILER, IDAHO: 64th Annual Gem Show; Magic Valley Gem Club, Twin Falls County Fairgrounds; Merchant Bldg. #1, 215 Fair Ave.; Sat. 9-5, Sun. 10-5; adults \$2, children (under 12) with an adult free; contact Shirley Metts, 550 Main St. S., Kimberly, ID 83341, (208) 423-4827; e-mail: imetts@centurylink.net

14-15—SAN MARINO, CALIFORNIA: Annual show; Pasadena Lapidary Society, San Marino Masonic Center; 3130 Huntington Dr.; Sat. 10-6, Sun. 10-5; free admission; member displays, demonstrations, jewelry making, carving, dealers, minerals, rough material, jewelry, gems, collectibles; contact Marcia Goetz, (626) 260-7239

14-15—CLIFTON, NEW JERSEY: Annual show; The North Jersey Mineralogical Society, Pope John II Center; 775 Valley Rd.; Daily 10-5; adults \$5, seniors \$4, children (under 12) free; more than 25 dealers, minerals, fossils, crystals, lapidary rough, jewelry, free specimens for kids; contact Jeff Wilson, 14 Beach Dr., Montague, NJ 07827, (973) 293-7911; e-mail: buckwood4@yahoo.com; Web site: nojms.webs.com

14-15—WAUKESHA, WISCONSIN: Annual show; Kettle Moraine Geological Society, Waukesha County Expo Center; 1000 Northview Rd.; Sat. 10-5, Sun. 10-4; adults \$3, children (under 12) free; agates, minerals, gems, fossils, cabochons, Native American artifacts, geology and Earth history displays, educational speakers, demonstrations, club sales, mineral and gem dealers, jewelry, lapidary, wire wrapping, fluorescence; contact Richard Rosenberger, 245 Meadowside Court, Pewaukee, WI 53072; e-mail: rosenber.w@sbcglobal.net; Web site: kmg-srocks.com

14-15—SPRECKELS, CALIFORNIA: Annual show; Salinas Valley Rock & Gem, Spreckels Vets Memorial Hall; 5th St. and Liano St.; Sat. 10-5, Sun. 10-5; Admission \$2.00; contact Teri Beck, (831) 679-2896; Web site: salinasrockandgem.com

14-15—SAN ANTONIO, TEXAS: Annual show; SAN ANTONIO GEM AND MINERAL SOCIETY, SAN ANTONIO TEXAS; 8111 MEADOW LEAF DR [CORNER OF I-410 WEST AND MARBACH]; Sat. 10AM-6PM, Sun. 10AM-4PM; Admission \$5, Seniors \$3, Students \$2, Children \$1; 54TH ANNUAL FIESTA OF GEMS; contact ROBERT BOWIE, (210) 860 2830; e-mail: krbotx@gtvc.com; Web site: www.swgemandmineral.org

14-15—KALISPELL, MONTANA: Annual show; NW Montana Rock Chucks, Flathead County Fairgrounds; 265 North Meridian Road; Sat. 10-5, Sun. 10-4; Admission \$1.00, Children Free; contact Kathy Fager, PO Box 5541, Kalispell, MT 59903; e-mail: babcockk@montanasky.net

14-15—TURLOCK, CALIFORNIA: Annual show; Mother Lode Mineral Rock & Gem Show, Stanislaus Fairgrounds; 900 N. Broadway; Sat. 10 am-5 pm, Sun. 10 am-5 pm; Adults \$6, Under 12 free with adult; Rock, Mineral & Jewelry Show! FAMILY EVENT Rocks, Minerals, Fossils, Jewelry, Beads, Fluorescents and more! Learn to make beautiful jewelry out of natural rocks and gemstones from our demonstrators. Children's Activities including making your own bracelet, and carving soapstone. We also have a HUGE fluorescent display tent. There are over 40 dealers selling rocks, minerals, fossils, jewelry, beads & supplies. We have much, much more... We would love to have you visit our show! See our website for more info and pictures!; contact Bud & Terry McMillin, CA, (209) 524-3494; e-mail: bud.mcmillin.b7yj@statefarm.com; Web site: www.turlockgemshow.com

14-15—COTTONWOOD, ARIZONA: Show and sale; CKM Productions, LLC, Mingus Union High School; 1801 East Fir Street; Sat. 10:00 am-5:00 pm, Sun. 10:00 AM-4:00 PM;

Adults \$3.00; Vendors from around the region will be offering crystals, mineral specimens, jewelry, gemstones, rough rock, fossils, and beads. Food and raffles will be available during the show.; contact Greg Capatch, (928) 554-4615; e-mail: gregcapatch@yahoo.com

14-15—TURLOCK, CALIFORNIA: Annual show; The Mother Lode Mineral Society of California, Stanislaus Fairgrounds; 900 N. Broadway; Sat. 10 am-5 pm, Sun. 10 am-5 pm; Adults \$6, Children 12 & under free with adults; Rock, Mineral & Jewelry Show! FAMILY EVENT Rocks, Minerals, Fossils, Jewelry, Beads, Fluorescents and more! Learn to make beautiful jewelry out of natural rocks and gemstones from our demonstrators. Children's Activities including making your own bracelet, and carving soapstone. We also have a HUGE fluorescent display tent. There are over 40 dealers selling rocks, minerals, fossils, jewelry, beads & supplies. We have much, much more... We would love to have you visit our show! See our website for more info and pictures!; contact Bud & Terry McMillin, CA, (209) 368-2797; e-mail: bud.mcmillin.b7yj@statefarm.com; Web site: www.turlockgemshow.com

14-15—OLD BETHPAGE, NEW YORK: Annual show; Island Rock Hounds, Old Bethpage Restoration Village; 1307 Round Swamp Road; Sat. 10 am-5 pm, Sun. 10 am-5 pm; Adults = \$6 two day, or \$7 daily, Children 12 & under free; We specialize in children's activities encouraging interest in geology and related sciences.; contact nancy colburn, 9 northcote road, westbury, NY 11590, (516) 334 4398; e-mail: nileda55@yahoo.com; Web site: www.islandrockhounds.org

20-22—TACOMA, WASHINGTON: Wholesale and retail show; Gem Faire Inc, Tacoma Dome; 2727 E D St; Fri. Noon-6pm, Sat. 10am-6pm, Sun. 10am-5pm; Admission \$7, Children Free (ages 0-11); Fine jewelry, precious & semi-precious gemstones, millions of beads, crystals, gold & silver, pearls, minerals & much more at manufacturer's prices. Exhibitors from around the world. Jewelry repair & cleaning while you shop. Free hourly door prizes.; contact Yooy Nelson, (503) 252-8300; e-mail: info@gemfaire.com; Web site: http://www.gemfaire.com

20-22—ASHEVILLE, NORTH CAROLINA: Annual show; Mountain Area Gem and Mineral Association, Camp Stephens; Clayton Road; Fri. 9:00 am-6:00 pm, Sat. 9:00 am-6:00 pm, Sun. 9:00 am-5:00 pm; Admission Free; Numerous vendors offering gems, minerals and fossils from North Carolina and around the world.; contact Richard Jacquot, POB 542, Leicester, NC 28748, (828) 779-4501; e-mail: rick@wncrocks.com; Web site: www.americanrockhound.com

20-22—JACKSON, MICHIGAN: Annual show; Michigan Gem & Mineral Society, Jackson County Fairgrounds - American 1 Event Center; 200 W. Ganson; Fri. 11-7, Sat. 10-6, Sun. 11-5; adults \$4, seniors \$2, students \$1, children (under 5) free; kids' activities, gems, minerals, fossils, beads, jewelry, lapidary supplies, demonstrators, exhibits, displays, silent auctions, door prizes, raffle; contact Sally Hoskin, (517) 522-3396; e-mail: saltoosal2@yahoo.com; Web site: mgmsrockclub.com

20-22—ALBUQUERQUE, NEW MEXICO: Annual show; Abq. Gem & Mineral Club, Expo NM; 300 San Pedro NE; Fri. 10 am-6 pm, Sat. 10 am-6 pm, Sun. 10 am-5 pm; Admission \$3, Children Free under 13; Friday is Dollar Day! 54 dealers, gems, minerals, jewelry, fossils, lapidary, equipment, tools, door prizes, raffles, silent auctions, junior table, live wolf & mineral ID. NM State Fairgrounds, Creative Arts Center, enter Gate 3 at San Pedro and Copper.; contact Paul Hlava, (505) 265-4178; e-mail: paulhlava@q.com; Web site: agmc.info

20-22—PUYALLUP, WASHINGTON: Wholesale and retail show; Gem Faire Inc., Washington State Fair Events Center; 110 9th Ave SW; Fri. Noon-6pm, Sat. 10am-6pm, Sun. 10am-5pm; Admission \$7, Children Free (ages 0-11); Fine jewelry, precious & semi-precious gemstones, millions of beads, crystals, gold & silver, minerals & much more at manufacturer's prices. Exhibitors from around the world. Jewelry repair & cleaning while you shop. Classes & demos. Free hourly door prizes. For more info, visit www.gemfaire.com or call (503) 252-8300 or email: info@gemfaire.com.; contact Yooy Nelson, (503) 252-8300; e-mail: info@gemfaire.com; Web site: http://www.gemfaire.com

20-22—ALBUQUERQUE, NEW MEXICO: Annual show; Albuquerque Gem & Mineral Club, NM State Fairgrounds, Expo NM; 300 San Pedro NE; Fri. 10 am-6 pm, Sat. 10 am-6 pm, Sun. 10 am-5 pm; 3.00, Free under 13; 46th Annual Gem, Mineral, Jewelry Expo. Admission \$3, Friday is Dollar Day, Kids under 13 are free. Enter gate 3 at 300 San Pedro NE and Copper, Creative Arts Center at the NM State Fairgrounds (Expo NM). 50 dealers, door prizes, raffle, silent auction, junior table, live wolf, display cases, mineral ID, gemstones, minerals, jewelry, beads, cabochons, fossils, tools, equipment. Contact: Paul Hlava, 505-265-4178, Web site: agmc.info; contact Paul Hlava, PO Box 13718, Albuquerque, NM 87192, 505-265-4178; e-mail: paulhlava@q.com; Web site: agmc.info

20-22—SPANISH FORK, UTAH: Annual show; Timpanogos Gem & Mineral Society, Spanish Fork, Utah, Fair

Grounds in the Indoor Tennis Court ; 475 South Main, Spanish Fork Fair Grounds, Indoor Tennis Court; Fri. 10 am-7 pm, Sat. 10 am-7 pm, Sun. 10 am-5 pm; Admission = Free; 56th "Spring Parade of Gems"; Timpanogos Gem & Mineral Society, Spanish Fork Fair Grounds, 475 S. Main; Free Admission; displays, dealers, jewelry, fossils, equipment, Mr. Bones, door prizes, touch table, rock sales, silent auction, rocks in the rough, minerals, lapidary equipment, Junior Club Booth, kids' grab bags, Wheel of Fortune, instruction on polishing cabochons. Demonstrations, faceting, flint napping, wire wrapping, beading, fluorescent mineral display. Contact Aaron Mcknight timprocks1@gmail.com. Web site: www.timprocks.weebly.com; contact Keith Fackrell, 2295 E 700 S, Springville, UT 84663, (801) 592-0410; e-mail: krfackrell@gmail.com; Web site: www.timprocks.weebly.com

20-22—DOSWELL, VIRGINIA: Annual show; Treasures of the Earth, Inc., Meadow Event Park; 13191 Dawn Blvd.; Fri. 12:00 pm-6:00 pm, Sat. 10:00 am-5:00 pm, Sun. 10:00 am-4:00 pm; Adults \$5.00, military free with ID, Children 16 and under free; Vendors from across the US bring their merchandise to you. You will find • 14K and sterling silver, classic, estate, fashion and hand-made jewelry • Loose stones, beads and findings, pearls • Mineral specimens, crystals, lapidary supplies • Books, carvings and gift items ; contact Jane Westbrook, PO Box 59, Gloucester Point, VA 23062, (804) 285-4281; e-mail: jane@treasuresoftheearth.com; Web site: www.treasuresoftheearth.com

20-22—ROME, GEORGIA: Annual show; Rome Georgia Mineral Society, The Forum; 301 Tribune St.; Fri. 10:00 am-6:00 pm, Sat. 10:00 am-6:00 pm, Sun. 11:00 am-5:00 pm; Admission is FREE; Free Admission! Minerals, Gems, Fossils, Meteorites, Jewelry, and Crystals for Sale. Lapidary rough, Free Mineral and Fossil ID, Door Prizes, and Exhibits! Free registration for grand prize—Amethyst and Calcite from Brazil!; contact Jose Santamaria, 311 E 4TH St., Rome, GA 30161; e-mail: rogams.show@gmail.com; Web site: http://rogams.wordpress.com/gem-and-mineral-show/

21-22—WHEATON, ILLINOIS: Annual show; ESCONI, DuPage County Fairgrounds; 2015 Manchester Road, 60187; Sat. 10:00 am-5:00 pm, Sun. 10:00 am-4:00 pm; Admission Free; The Esconi 2015 Gem, Mineral and Fossil show will be running on March 21st & 22nd, at the Dupage County Fairgrounds, 2015 Manchester, Wheaton, IL. The show will feature gem, jewelry, fossil & mineral dealers, live & silent auctions, craft demonstrations, book sales, kid's corner and geode cracking. Children under the age of 16 can receive a free geode at the geode booth! More information on the show is available at www.esconi.com.; contact Jeff Lord, (224) 231 7301; e-mail: jlord83@yahoo.com; Web site: www.esconi.org

21-22—LEMOORE, CALIFORNIA: Annual show; Lemoore Gem & Mineral Club, Trinity Hall; 470 Champion St.; Sat. 10-6, Sun. 10-4; free admission; contact Keith Olivas, PO Box 455, Lemoore, CA 93245, (559) 622-9440; e-mail: georgersilva@sbcglobal.net

21-22—PORT ANGELES, WASHINGTON: Annual show; City of Port Angeles, Vern Burton Community Center; 308 East 4th Street; Sat. 9 am-6 pm, Sun. 10 am-5 pm; Admission Free, Children Free; Free rocks for the kids while supplies last, over 30 vendors selling rough & polished rocks, gemstones, fossils, beads, slabs, carvings, crystals, mineral, Uruguay amethyst geodes, shells, jewelry, wire wrapping, woodworking, cabochons, equipment, and much more! Free door prize.; contact Cindy Kochanek, 308 East 4th Street, Port Angeles, WA 98362, (360) 417-4550; e-mail: ckochane@cityofpa.us; Web site: www.cityofpa.us

21-22—GAITHERSBURG, MARYLAND: Annual show; The Gem, Lapidary and Mineral Society of Montgomery County, Maryland, Montgomery Co. Fairgrounds; 16 Chestnut St.; Sat. 10:00am-6:00pm, Sun. 11:00am-5:00pm; Admission \$6.00, Children Free; Gem, Lapidary, and Mineral Society of Montgomery County MD., Inc. 51st Annual GLMSMC Gem, Mineral and Fossil Show At the Montgomery County Fairgrounds – Gaithersburg, Maryland March 21 & 22, 2015. More than 20 dealers will have gems, minerals, fossils, meteorites and crystals for sale. Enjoy demonstrations, over 40 exhibits, raffle, door prizes, free workshop, free specimens for kids, and/or get more information about specimens from your own collection. Those under 18 can dig for free specimens in the kid's mini-mines! ; contact Jim Kostka, 906 North St NE, Leesburg, VA 20176, (202) 207-5437; e-mail: jkostka@juno.com; Web site: http://www.glmsmc.com/show.shtml

21-22—SEATTLE, WASHINGTON: Annual show; North Seattle Lapidary & Mineral Club, Lake City Community Center; 12531 28th Ave. NE; Sat. 10:00 am-5:00 pm, Sun. 10:00 am-5:00 pm; Admission is FREE; Many junior activities, demonstrations, club member displays, the best grab bags, Rockosaurus rides, Rockhound Dinner, dealers, door prizes, and more! Food trucks will be standing by!; contact Susan Gardner, (425) 483-2295; Web site: www.NorthSeattleRockClub.org

21-22—CHAMBERSBURG, PA 17201, PENNSYLVANIA: Annual show; Franklin County Rock and Mineral Club, Inc., Hamilton Heights Elementary School; 1589 Johnson Road ; Sat. 10:00 am-5:00 pm, Sun. 10:00 am-4:00 pm;

continued on page 59




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ROSWELL Pecos Diamonds



Orange Starburst Quartz Crystals on Top of Desert Sands



Many states have their own varieties of “diamonds” that are really quartz crystals. New Mexico boasts opaque orange clusters called “Pecos diamonds”.

Story and Photos by Robert Beard

Unusual occurrences of terminated, clear or colorful quartz crystals are often tagged with the nickname “diamonds”. While quartz is very different than diamond, calling a quartz crystal a diamond gets attention. Many states have their own varieties of “diamonds” that are really quartz crystals. For example, New York has “Herkimer diamonds”, and New Jersey has “Cape May diamonds”. Arkansas has a park where you can actually collect real diamonds, and diamond is the state gem of Arkansas. However, Arkansas still has to market its state mineral, which is quartz crystal. Clear quartz crystals from Arkansas have been called “Hot Springs diamonds” and “Arkansas diamonds.”



This is a typical orange “starburst” Pecos diamond. They are found lying on the ground throughout the site.



This westward-draining arroyo has excellent exposures of bedded white gypsum. Erosion along the base of the arroyo exposed the gypsum beds.

In New Mexico, “Pecos diamonds” are quartz crystals that weather out of gypsum in the southeast corner of the state, near the Pecos River. Pecos diamonds are small, often doubly terminated quartz crystals that occur in the Permian Seven Rivers Formation in the Pecos River Valley. The Seven Rivers Formation is composed of gypsum, anhydrite, salt and dolomite, and can be described as an evaporite with fine-grained, mixed clastics, and dolomite.

Pecos diamonds likely formed from low-temperature solutions that permeated the gypsum beds of the Seven Rivers Formation and replaced the gypsum with the silica in the fluids. The crystals then weathered out of the formation and lay on the ground surface. They range in size from microscopic to over 2.5 inches long, and average just under an inch. Their colors range from white to red to yellow to nearly black, and the crystals are transparent to opaque.

Occurrences of Pecos diamonds generally follow the course of the Pecos River from just north of Dunlap, near the DeBaca and Guadalupe county line, to south of Artesia, in Eddy County. The earliest description of Pecos diamonds reportedly dates back to 1583, when Don Antonio de Espejo, one of the earliest Spanish explorers in New Mexico, described them in his report to the King of Spain. Espejo reportedly wrote that “in some places the desert appeared to be paved with diamonds”. Espejo was trying to convince the king to fund another expedition to New Mexico, but unfortunately never got the chance to make it, as he died in Havana during his return to Spain.

Unfortunately, I have not been able to find a translation of his original report with



Most of the crystals found at the locality described in *Gem Trails of New Mexico* are opaque orange and are easy to spot in the light-tan soils of the site.

its mention of Pecos diamonds, so I cannot confirm that he actually made the statement. The only references to mention Espejo and Pecos diamonds that I have found are 20th- and 21st-century texts. Nevertheless, Espejo was one of the first explorers to actively look for gold in New Mexico, and since he traveled through the valley of the Pecos River it seems likely he would have come across Pecos diamonds. He and his party would have been among the first to see the crystal fields before they were

picked over by collectors, and the desert may well have appeared to be paved with diamonds back in the late 1500s.

An article on Pecos diamonds, entitled “Pecos diamonds-quartz and dolomite crystals from the Seven Rivers Formation outcrops of southeastern New Mexico”, by James Albright and Virgil Leuth of the New Mexico Bureau of Geology and Mineral Resources, has excellent information on the origin of Pecos diamonds and references several localities. I highly recommend this



Pecos diamonds are quartz crystals that weather out of gypsum. This rock in the gypsum beds was packed with gypsum fragments, but did not contain any obvious quartz crystals.



Some of the quartz points are sharp, indicating that these crystals were not transported far from their point of origin. Many of the clusters had formed in a "starburst" pattern.

article to anyone interested in Pecos diamonds, as it also lists many key references. This article was published in *New Mexico Geology*, Vol. 25, No. 3 (2003), and can be obtained at https://geoinfo.nmt.edu/publications/periodicals/nmg/downloads/25/n3/nmg_v25_n3_p63.pdf. The paper does not list the location described in this article, but it describes a location around nearby Acme and several others.

My initial impression, based on reading various mineral-collecting guides, was that

Pecos diamonds would be very easy to find. Back in 2000, I visited eastern New Mexico and used Jim Mitchell's book *Gem Trails of New Mexico* (Gem Guides Book Co.) to visit some sites near Roswell and Artesia. Unfortunately, this trip was taken long before I had a GPS unit, and I was really not sure what to look for in order to identify the collecting area described in the book. I was completely skunked on this trip, and was very frustrated in my first search for Pecos diamonds.

In the meantime, one of my colleagues from work had just returned from New Mexico with a plastic baggie full of Pecos diamonds. She said that she had been given them by someone who knew where to collect them, but unfortunately she had no idea where they were from, other than that they came from New Mexico. For the first time, I got to see actual Pecos diamonds. The crystals were mostly doubly terminated quartz crystals, milky white to orange, and about 1/2 inch to 3/4 inch long. They also had smaller crystals that had grown on them, and some of them were twinned and had two points on the end of the crystal instead of just a single point.

I did not have a chance to return to southeast New Mexico until 2006, but this time I had a better idea of what I was looking for. I decided to focus on the location in *Gem Trails* that is northeast of Roswell, as it was very accessible. I stopped at the location late one afternoon in late May.

The Roswell location for Pecos diamonds, as described in *Gem Trails*, is very easy to find, as it has a very distinct landmark, the stone remnants of the abandoned Frazier Schoolhouse, which is just north of U.S. Highway 70. They are easy to spot when driving on the highway in either direction.

I stopped by the schoolhouse to take some pictures, and then drove north on the dirt road to the area suggested in *Gem Trails*. I then got out of the car and started looking in the drainages. I was not finding anything, so I looked at some of the smaller stones that had weathered out of the soil above the drainages. It was in the flat areas of soil, and not in the drainages, that I began to find orange-pointed quartz crystals. Many of them were in a "starburst" pattern, in which the crystals appear to radiate out from a central point. These were Pecos diamonds.

I quickly began to find a lot of crystals. They were loose on the surface and very easy to spot. Nearly all of them were orange. In a shallow draw, I found a small pile of 30 to 40 crystals that had weathered out of the reddish, unconsolidated soil. The individual crystals were about 1/4 inch to 1 inch long, and the radiating crystals were about 1/2 inch to 1 inch wide. Unfortunately, my GPS malfunctioned that day, and the coordinates that I collected did not match up with the observations I made later from the satellite photos on Google Maps.

In December 2012, I returned the area again with my wife and kids, but a very unusual snowstorm had occurred the day

before. We drove out to the locality, but it was covered with snow, and it was not going to melt anytime soon. It was one of the few times one of our collecting trips had been thwarted by snow in southern New Mexico. Instead of mineral collecting, we visited the UFO museums in Roswell, which are a good side trip during visits to the Roswell area.

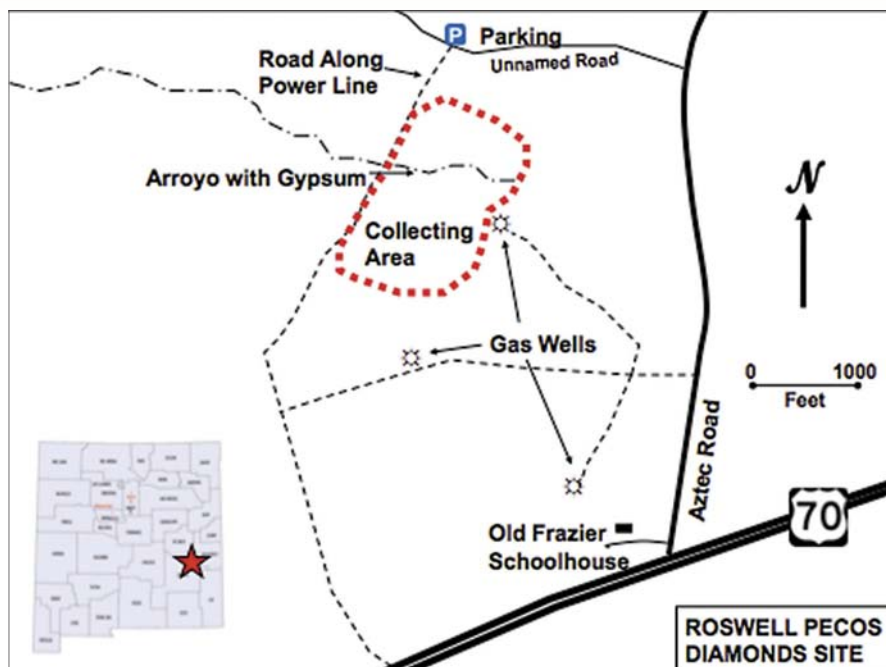
I really wanted to come back to the site to get good coordinates and get some more Pecos diamonds. I finally made it back in October 2014. There was no snow, but the week before a huge hurricane had blown up from the Gulf of California and dumped several inches of rain over south-east New Mexico. The rains resulted in a monstrous mosquito bloom, and billions of mosquitoes were emerging from the remnants of the standing water along the arroyos and mesas, especially along the saturated soils near the Pecos River. This made my visit very unpleasant. I had come equipped with lots of water and sunscreen to fight off the heat and the sun, but I did not have any bug spray.

I could not remember where I had originally parked, and not having any coordinates I had to rely on my memory and my latest edition of *Gem Trails*, which had been published in 2001. The dirt road just east of the school is Aztec Road, and I drove north on this road, looking for a suitable road to take to the left (west), which would take me into the area with the quartz crystals.

The first road led to a small tank for an oil and gas well, and I did not want to encroach on any private property, so I continued farther north. The second road to the west appeared suitable for my car, and I drove down it. Fortunately, despite the recent heavy rains, the road was in good shape and did not have any significant muddy sections.

It also did not have any good places for parking along the side. I decided to drive to the power line that crossed the road, as power lines generally have areas where you can pull off and turn around. Sure enough, the north side of the road, where it intersects the power line, had a small area where I could turn around and park, and from here it was a matter of walking.

I was immediately attacked by hundreds of mosquitoes when I got out of my vehicle. Of course, this was not the first time I'd had to deal with the pesky insects when mineral collecting. I used an old trick, which at this time was the only



The first road led to a small tank for an oil and gas well, and I did not want to encroach on any private property, so I continued farther north.

defense that I had: Rather than swat the mosquitoes and have them break apart on my skin, smearing it with blood, I simply brushed them away. I had heard that the scent of the blood only serves to attract more mosquitoes.

I once mentioned this trick to my friends when we were caught by mosquitoes at a golf course without any insect repellent. One of them thought this was nonsense. He said if a mosquito gets on him, he is going to kill it. As I recall, while I just brushed the mosquitoes away, he kept slapping his, and soon the mosquitoes seemed to focus on him.

Since I did not have any insect repellent or a companion who could attract mosquitoes, brushing the mosquitoes was my only strategy, and while not perfect, hiking with the mosquitoes became tolerable.

I hiked along the road with the intention of reaching the first large arroyo and then hiking eastward upstream. All of the arroyos in this area drained to the west toward the Pecos River. The ground was relatively flat at first, but then the road became much steeper as I approached the first large arroyo that crossed the road.



The Pecos diamonds were loose on the surface and very easy to spot. Nearly all of them were orange. These were found within a few inches of each other.

There were a few cows near the arroyo, and a small dam had been built to capture drinking water for them. This was also a major mosquito hatchery, so I stayed away from the water. Erosion along the base of the arroyo exposed white gypsum beds with sections that were packed with small gypsum crystals. I closely inspected the bedded gypsum and the rocks with the gypsum crystals, but to my disappointment they did not appear to have any quartz crystals.

I looked in the arroyo for quartz crystals, but did not find any. I soon climbed out

of the arroyo and headed southeast to the flatter areas. I could see a small vertical tank at an oil and gas well site, and this was a useful reference for my location.

I soon saw an orange starburst crystal on top of the sandy soil. It was only about 1/2 inch wide, but it had several small terminated points. I soon found several more, and they were about 1/4 inch to 3/4 inch wide. I had brought a small plastic baggie for the crystals, and this was much better than trying to put them in my pocket or backpack.



Walking the flat terrain of the collecting site was very easy. Recent rains had undoubtedly helped wash some of the quartz crystals out of the soil.

Nearly all the crystals I found were in a starburst pattern, and the starburst was only on one side. The bottom of the starburst crystals was generally flat. I also found some that were doubly terminated, but these seemed to be the exception. All of the crystals were opaque orange, and I did not find any clear or white crystals.

All the quartz points were well defined, indicating that they had likely weathered out of the gypsum beds and not been transported a significant distance. If they had washed downstream, the points likely would have been rounded. In about an hour, my baggie was about a third full, and I would have stayed longer if not for the mosquitoes.

The site was much as I remembered it from back in 2006. The walking was very easy, and the Pecos diamonds were still abundant. The recent rains undoubtedly helped wash some crystals out of the soil, but since the area was relatively flat, I think most of the rain likely soaked into the soil or flowed down the arroyos. The only big difference in my visit in 2014 was the mosquitoes. They nearly spoiled the trip, and I will never go anywhere again without a full bottle of mosquito repellent.

After I returned home, I put my bag of Pecos diamonds on a table in our living room and immediately realized an obvious danger of these crystals: They bear a strong resemblance to rock candy. About the worst thing you can do is to admire your crystals by putting them in bowl outside of a display case. Adults, not just small children, can easily be fooled by these crystals. They are not poisonous, but it would only take one crunch to realize that you had made a terrible mistake. For the sake of your family and friends' teeth, keep these crystals in a secure display cabinet to prevent a really dumb accident. If someone munches on a Pecos diamond by mistake, it will be your fault!

The following are coordinates collected in the field and using satellite photographs from Google Earth (downloaded from www.google.com). All coordinates are referenced using the North American 83 and World Geodetic System 84 (NAD83/WGS84) datum, and are in the degree-minutes-seconds format:

Parking at power line:

33°36'48.3"N, 104°20'13.9"W

Area with abundant Pecos diamonds:

33°36'27.3"N, 104°20'13.0"W

Arroyo with bedded gypsum:

33°36'34.6"N, 104°20'22.0"W

To get to the site, take U.S. Highway 285 north from Roswell, then veer east on U.S. Highway 70. Proceed 13.9 miles northeast and turn left (north) onto Aztec Road. Continue north for 1.0 mile, then turn left (west) onto an unmarked road. Go approximately 0.5 mile to a power line, and park in the small area on the north side of the road beneath the power line.


From here, walk south approximately 1,500 feet on a rough road to a large arroyo. Follow the arroyo upstream for approximately 300 feet, cross the arroyo, and walk toward the small, vertical steel tank at a gas well, which is approximately 1,000 feet to the southeast. Orange Pecos diamonds can be found on the ground surface between the arroyo and the gas well.

The collecting area likely extends farther south, but I have not had the chance to verify this. If you collect in this area, you may find some sections that are much richer or poorer in Pecos diamonds.

Most of the area is administered by the U.S. Bureau of Land Management, and I did not see any signs indicating private land, except near the small oil and gas well. If you visit this site, make sure that you stay away from this well and the other wells in the area. I did not see indications of active mining claims or other prohibitions to mineral collecting in the area. This is always subject to change, so you will want to be aware of any current mining claims or other restrictions that could affect access to the area.

There are also many other areas with Pecos diamonds in the region, so you may want to research additional localities before you visit. As always, make sure that you are not encroaching on any active claims or private lands.

This is an easy-to-reach locality when you are in the Roswell area, and the only tool you'll need for collecting is a plastic baggie. A two-wheel drive vehicle with moderate clearance is fine for this trip. If you are uncomfortable with taking the side road, you can also park along Aztec Road and walk, providing you leave enough space for others to pass you on the road. You may also be able to park near the abandoned schoolhouse and walk to the site. Be sure to bring sunscreen, water, and mosquito repellent to help stay comfortable and safe during your trip, and you should be able to find plenty of Pecos diamonds. 💎



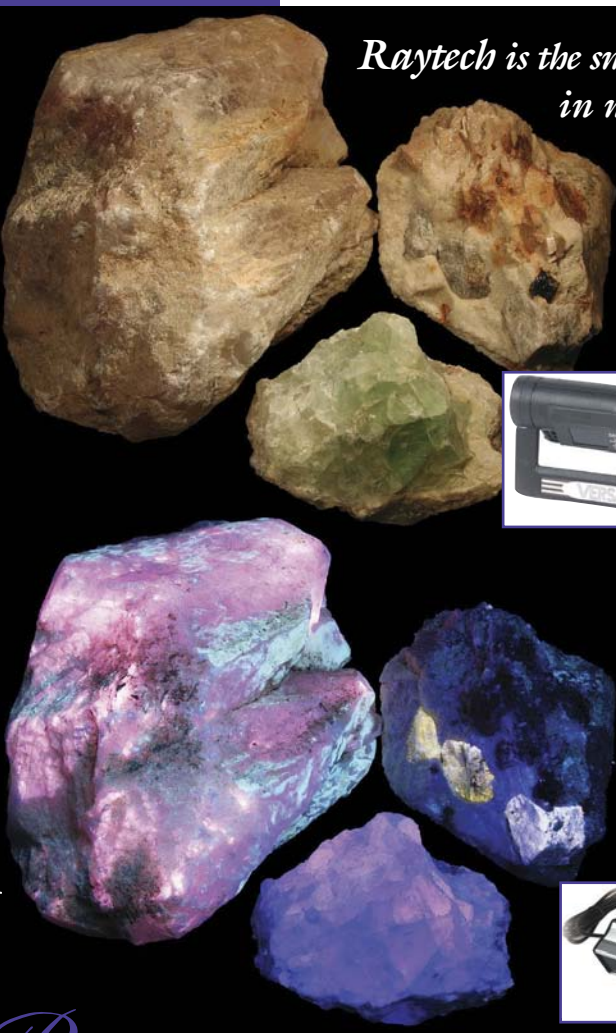
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Beryl comes in many varieties: blue aquamarine, yellow heliodor, pink morganite, red bixbite, colorless goshenite. A green variety—emerald—is well known even to non-rockhounds and is considered the most valuable. Emerald is beryl that crystalized in the presence of chromium. Most emeralds form in metamorphic schist or beryllium-rich granitic pegmatites although some deposits are of hydrothermal origin, in veins of calcite and albite in shales and limestones. Crystals are hexagonal like quartz but with flat terminations.

Vitreous luster and high hardness (Mohs 7.5-8) make emeralds fantastic gemstones. However, nearly all emeralds contain fractures and inclusions that make them brittle and difficult to facet. They require skilled cutters long practiced in the trade. Most emeralds, after being cut, are treated with oils to fill fractures, a long-accepted tradition. If flaws can be seen only under magnification—not by the naked eye—an emerald is said to be “eye-clean” and flawless. Emeralds containing too many inclusions are cut into rounded cabochons.

Egyptian pharaohs wore emeralds in 3,000 BCE. Emerald is mentioned in the Hebrew Bible as one of 12 stones on the breastplate of the high priest. South American Incas and Aztecs considered it a holy stone. Emperors and empresses in Iran wore them, as did Turkish sultans and Indian maharajas.

Gemstone lore abounds with fabled emeralds: the over 1,000-carat Duke of Devonshire emerald; the ring-set Chalk emerald; the carved, rectangular Mogul Mughal; the Hooker emerald brooch; Mackay emerald necklace, and the Bahia emerald crystal, still in matrix. Emeralds were once believed to

COURTESY ROB LAVINSKY



restore failing eyesight and to provide clairvoyance (an ability to see into the future). Today, emeralds are the birthstone for May and are used to mark a 55th anniversary.

Columbia is the largest producer of emeralds, followed by Zambia. Other important sources include Brazil, Zimbabwe, Madagascar, Afghanistan, Pakistan, India and Russia. In the United States, a famous locality is the Hiddenite mine near Stony Point, North Carolina, and it is that state's gemstone.

—Jim Brace-Thompson

Devil's Toenails

In pre-scientific times, Europeans far removed from the sea would occasionally find strange shell-like things weathering out of the earth in profusion. In size and shape, they looked like gnarly oversized toenails and earned the moniker “Devil's toenails.” In the 1600s, one report claimed these shells, when powdered, could cure a horse's sore back. Perhaps due to their twisted, contorted appearance, it was also said they could cure painful joints twisted by arthritis.

These were actually marine oyster shells of the extinct genus *Gryphaea* (pronounced gry-fee-a). Oysters are bivalved mollusks related to clams and mussels. “Bivalved” means they had two shells protecting the body of the creature within. While the two shells of a clam or mussel are mirror images of one another, one oyster shell is usually larger than the other. The larger shell lies on the bottom, and the smaller upper shell opens to allow in water and food particles. With *Gryphaea*, the larger, bottom shell (or left valve) is curved with a beak and the upper shell (right valve) is like a small flat plate.

Gryphaea occurs commonly in Jurassic sediments in Great Britain, and they are found in abundance in Cretaceous beds in such U.S. states as Texas and Utah. Where they occur, they are typically numerous and easy to find. They must have lived in immense colonies and provided a hard, steady surface on shallow, wave-washed seafloors of mud or sand for other creatures to latch onto and grow. Larger specimens often have encrustations of worm tubes, bryozoans, or other sea creatures. The lower shells are especially strong and thick, which is probably why you usually find a greater abundance of those than the smaller, thinner upper shells.

—Jim Brace-Thompson



2015 Youth Poster Contest:

"Your State Rockhound Symbols"

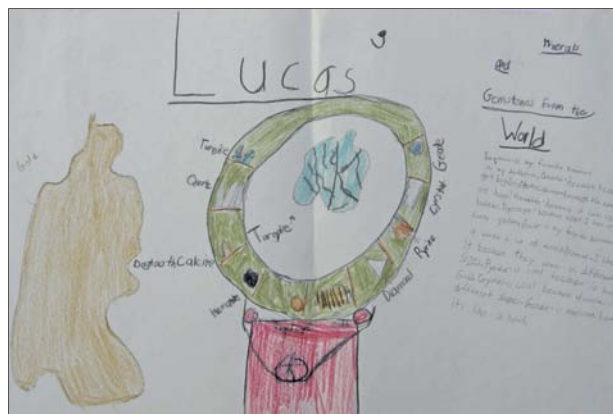
Calling all artists! The Midwest Federation of Mineralogical & Geological Societies is hosting a Youth Poster Contest sponsored by the Summit Lapidary Club of Ohio. It's open to kids in first through eighth grade across all seven AFMS federations as well as to kids not officially affiliated with any club. This year's theme is "The Official State Gem, Mineral, Rock, or Fossil of the State You Live In". Each grade level will have a winner, with ribbons awarded to First through Fourth places. First through Third place winners also receive a prize.

All entries must be on paper 12 inches by 18 inches with your name, address, age and school grade on the back. Artwork can be in pen, ink, crayon, magic marker, paint, or similar artist's medium. No three-dimensional posters accepted. A title may be on the front or back of the poster. List your state and why you chose the gem, mineral, rock or fossil. Finally, all entries become property of the Midwest Federation and Summit Lapidary Club.

Judges will award points as follows: 30 for originality and artwork; 25 for design; 25 for title; and 20 for listing of state gem, mineral, rock or fossil and the reason for your choice. Send your poster to Jennifer Fike, P.O. Box 26276, Akron, OH 44319. It must be postmarked no later than May 1, 2015. Direct questions to Jennifer by e-mail at SLC.youth.poster.contest@gmail.com. Further contest information is on the Midwest Federation Web site, www.amfed.org/mwff/.

Three-time Summit Lapidary Club president David Rich got the first contest off the ground locally before gaining the backing of the Midwest Federation and going national with the idea. Past contest themes have included Minerals of the World, My Favorite Fossil, and Birthstones. Enter the 2015 contest today and watch for the contest when it comes around again in 2016!

—Jim Brace-Thompson



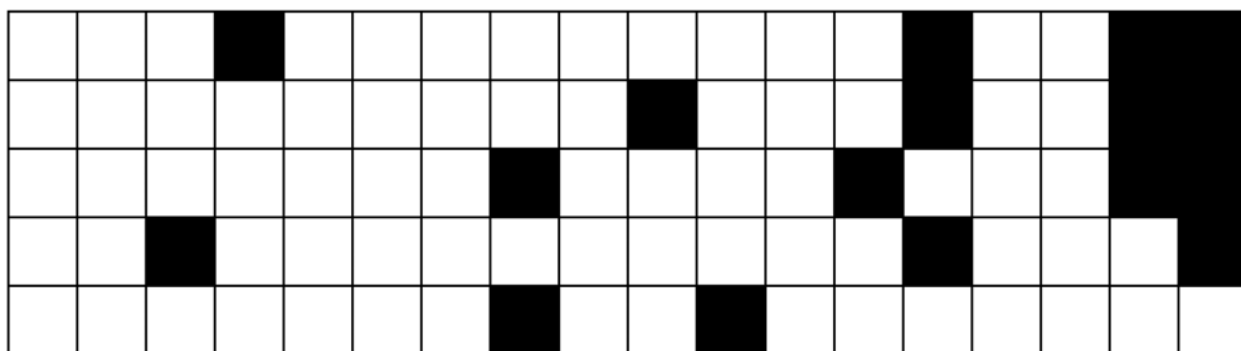
"Lucas' Minerals and Gemstones from the World" by Lucas Kowski



"King's Beauty" by Nicholas Presto

Fossils in Mythology

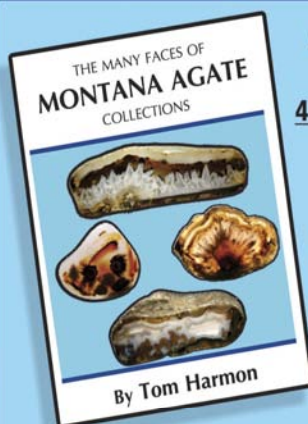
What did people make of dinosaur fossils when they came across them thousands of years ago? Arrange the letters from each column in the boxes above to find out.



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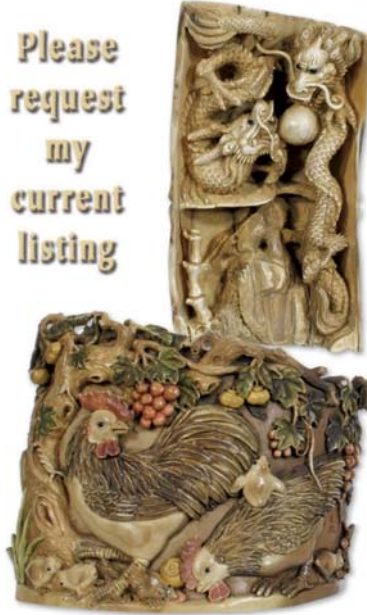
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Mary Ellen JASPER

Iron Stromatolites from Northern Minnesota

Story and Photos by Mark Leatherman

Over 2 billion years ago, in the Proterozoic Era, blue-green cyanobacteria (*Collenia undosa*) were among the first organisms to evolve from the ancient seas. They harvested solar energy to process carbon dioxide, absorbing carbon for continual growth and releasing oxygen as a byproduct. At this time in Earth's history, the atmosphere was devoid of oxygen (less than 1%), and these interesting critters began the slow buildup of an oxygenating environment, to which all multicellular life can attribute its existence.

The bacteria would trap muddy sediment, washed in from rhythmic, shallow tidal currents, by secreting biofilms. In order to access precious sunlight, the bacteria would mobilize upward. In the process, sedimentary layers were formed that eventually created the stony colonial mats that we now know as stromatolites. The eventual introduction of quartz allowed the formation of what we now call Mary Ellen jasper.

It is interesting to note that these layers are rarely planar; the curvature, or sinuosity, of these layers is a result of the bacteria wanting to face the sun at all times, despite its changing position throughout the seasons.

As a result of this sun-seeking phenomenon, scientists have used stromatolites to de-



The sinusoidal habit and striking color contrast make Mary Ellen jasper desirable for any lapidary worker.

termine how the number of days per year has changed throughout earth's history. At the time of primary iron ore creation, the planet's rotation was significantly faster, resulting in a year that was over 1,000 days long! Scientists discovered these "living fossils", which were once thought to be long extinct, in the southern end of Shark's Bay, Western Australia, in 1956. This alone is a testament to their adaptability through stark environmental changes and multiple mass extinctions.

As significant as their contribution to changing the atmosphere into a more livable state was, new oxygen was not immediately available for this role for at least another 100 million years. At the time, Earth's crust and oceans were loaded with

iron and other readily oxidizable elements, which used up the supply. This led to the creation of major iron ores that populate northern Minnesota, Wisconsin and Michigan, and other locales.

My first exposure to stromatolites was on a field trip I took to the Finger Lakes Region of New York State as an undergraduate student, back in 2005. After I learned of their old age and the wonders of how they colonize, they became one of my favorite sedimentary structures.

During a separate class trip to Upper Michigan, I was enthralled by the formation of red-and-silver sedimentary jaspillite (a.k.a., banded iron formations, or BIFs, containing quartz). Therefore, when I was



The main pit area is approximately 2,000 feet long by 700 feet wide, and consists of roughly two "levels" on which piles of varying sizes and finds were present.

invited for a trip to northern Minnesota's Mary Ellen mine for the first time, I was definitely in for a treat!

I was living in Ely, Minnesota, and working for an exploration firm when I was first told about the Mesabi Range Geological Society (MRGS) by three of my co-worker geologists. The Mesabi Iron Range, located in northeast Minnesota, is the largest iron deposit in the nation. Located within the region is the Mary Ellen mine, which is known for its jasper, for which stromatolites are directly responsible.

Some of the trapped sediment within some stromatolite mats oxidized into hematite (Fe_2O_3) and magnetite (Fe_3O_4), thus starting the creation of the jasper around 1.85 billion years ago. The iron ore "factory" continued until there was nothing left to oxidize (roughly 1.1 billion years ago), and oxygen could start taking up residence in the atmosphere.

The jasper and associated iron ore comprise part of the extensive Biwabik Iron Formation, which is composed of four distinct members or units: (bottom to top) Lower Cherty, Lower Slaty, Upper Cherty, and Upper Slaty.

Historically, the Upper Cherty was mined by Erie Mining Co. for its magnetite (Fe_3O_4) content, while the Lower Cherty was the principle iron ore mined throughout the Mesabi Range. The cherty members arose as a result of hydrothermal fluid circulation that dissolved quartz in the area, and re-precipitated it with iron minerals to form an intergrown texture. This same action also resulted in the pseudomorphism of the stromatolites, thus finishing the Mary Ellen's transformation. The thermal source was none other than the emplacement of the Duluth Complex, not too far to the east. This thermal, or contact, metamorphism also gave rise to other minerals found along the range, including pyroxene, olivine, cummingtonite and hornblende.

After I had given a talk at one of the MRGS meetings, the members invited me along on their annual field trip to the Mary Ellen mine as a guest. It was early on a brisk October morning when we left Ely and started southwest along state Route 1/169. Just past the town of Tower, we turned south onto state Route 135 and passed Embarrass before



The deep, blood-red stromatolites are often the most sought after, even if they do not show small-scale layering.



Although it is somewhat rarer, primary iron mineralization, such as the small botryoidal hematite crystals that cover this plate, can reward the lucky hunter.

turning west again to the “range” town of Biwabik. After a straight shot through downtown, we turned right on County Road 715, then took the Austin Powder gate turnoff to the left after approximately 1,000 feet.

A couple of the members stepped out to set up signs for the upcoming crowd. The rest of us continued straight past a set of abandoned mine infrastructure, and MRGS members flowed in, convening at the 10-bay garage of then-owner Tom Gardner. As a relatively new member of MRGS, I spent some time exchanging pleasantries until 10 a.m., at which time everyone gathered for the preliminary geology and safety talk.

The namesake of the Mary Ellen mine is rumored to have been the first staker’s girlfriend (if that is not love, I do not know what is!).

In going over the general geology, Mr. Gardner was kind enough to bring some historical cross-sections of the mine used by Pittsburgh Pacific Co. After various club members chimed in with their own personal nuggets of historical Mary Ellen knowledge, we were given the treat of being shown some polished slabs of the prized stone by Mark Sutich at Laurentian Monument, Granite and Stone. It turned out he had a few slabs ripe for the picking for those who wanted a little bit of a head start with their collection. Knowing my particular luck (or lack thereof) at times, I shamelessly helped myself to one!

After an hour-long briefing, everybody proceeded to drive a few hundred meters down to the mine area and started to disperse to their initial digging spots of choice. The main pit area is approximately 2,000 feet long by 700 feet wide, and consists of roughly two “levels”, on which piles of varying sizes and finds were present, as well as a filled pit lake, which some members elected to take boats out on.

I started my hunt for Mary Ellen on the lower level at the biggest rock piles, which were just off of the main driving path. My plan was to start there and work my way back from the lake to where some senior society members had set up shop.

After a short while, I made my first find—not of the pretty lady, but of some millimeter-scale botryoidal hematite crystals on a tabular, massive, limonite-cherty hematite matrix. Continuing northward, I began to spot some similar-size intermixed smoky and clear quartz points on black-and-white banded iron-formation matrix. After roughly a half hour of searching at this immediate area, the anomalously warm October sun forced me to take a short breather.

After getting to know some of the other members and sharing experiences in teaching, I started to move west toward the upper level, where prospects seemed to be somewhat more promising, based on the steadily increasing number of people flocking to the area. Sure enough, it was there that I saw my first signs of m'lady.



In this wonderful and unique collecting place, loose hazards are all over and climbing is definitely not advised.



Chunks of clean, rich-red jasper in a magnetite matrix can be found near the pit lake.

The first stromatolites I collected were whole columns in matrix that were no more than an inch wide, and were pinkish-cream in color. After collecting several pound-scale specimens, I continued on up to the top level and started to walk along the ridge, where there were a few large boulders of jasper. Though wishing I had brought a bigger sledgehammer, I was able to remove some medium-size boulders from the dirt with my pick hammer and mini-sledge.

After heading northwest and exploring away from the crowd for a half hour with no additional luck, I had started to backtrack when I heard vehicles starting to make their way toward the pit lake for lunch (probably to facilitate any fish cooking that might occur).

After showing off some current finds over burgers, brats, and beverages, some younger guests were making their way a hundred feet south to the biggest rock pile on the edge of the pit lake. Being satisfied

with my current finds, I decided I would take a stroll over for just a few minutes. It ended up being more than a few minutes, as it was there that I spotted the larger boulders of folded, deep-red, stromatolitic jasper in magnetite matrix. It was a great thing I decided to move my collection pile down to the grill site beforehand, as I found myself making a couple trips and retrieving some additional small boulders. It was at this point that I wished I owned a pickup truck, since I looked up and saw the MRGS vice president lift a 50-pound boulder onto his tail bed!

Overall, I ended up taking home about 40 pounds of rough rock, given that I only had a small sedan with me, and was quite content. I had gathered mostly light-pink and cream-colored fossils, with only a couple specimens that were the desirable deep red. A few had the added character of showing off some thin, white quartz veins running parallel to some individual algal mats.

It should also be duly noted that, probably unlike the Mary Ellen person herself, the vast majority of rough rock may not immediately make one fall in love at first sight. Most of the rough I collected was covered with some form of weathering, and some ends have a regular pattern of pitting (like some rugose coral specimens). Only a couple pieces I found had some naturally smooth planes. The true beauty will come with cutting and/or tumble polishing the material. My conclusion is that collecting Mary Ellen jasper is very much akin to geode hunting; oftentimes you never know the true beauty within until you get cracking!

Since the Mary Ellen Pit is considered an older mine site, hazards that present themselves are plentiful. Common sense should prevail. Do not climb on loose tailing piles and do not roll boulders down them. Extra care should be exercised when hammering on isolated boulders near cliff edges. Although visibility at the site is excellent, do not wander off alone. Lastly, since specimens are quite hard and can be sharp, heavy-duty boots and safety glasses are a must.

Specimens of Mary Ellen take an exceptionally brilliant polish due to the iron they contain and, depending on the quality of the specimen, can take a mirrorlike finish with an amazing red-silver contrast. Most of the finished work I have seen consists of hand-size cut slabs. The present mine owners, Mark and Kandi Surich of Laurentian Monument, Granite, and Stone, are in the process of attempting to extract and cut large slabs for use in countertops. According to some shop workers, the estimated cost of a Mary Ellen countertop will run at least \$300 per square foot!

Shortly before the time of writing, the company had been busy building new infrastructure and purchasing new equipment for their operations (they had moved from the nearby town of Hibbing). I spoke



Cross sections of individual algal columns show striking and often warped growth banding. It is these features that help reconstruct past rotation rates of the early Earth.



Along with jasper, samples of hematite-rich chert are in absolute abundance in the large rock piles. This material was important during the early days of Minnesota's iron-mining heritage.

to Mr. Surich, who told me that requests for visits to the pit at any time will be entertained, as long as at least one week's notice is given. (If one decides to visit during the winter in these parts, that's a whole another level of a crazy rockhound!) They are even gracious enough not to charge any entrance fees nor charge for the material that is taken out. The company can be reached at (218) 741-3641.

I was also told that there are rarer green and golden varieties of Mary Ellen to be found. Mr. Surich said that it takes quite

a bit of luck to find those, and more often than not, one will not know if they have found such a sample until they saw it open. If one can find either variety on their first tour (or two), they are much luckier than I!

A trip to the Mary Ellen Pit was definitely a highlight of a young rockhound's growing list of journeys. I cannot think of many other places that offer metallic iron minerals, fossil pseudomorphs, evidence of our planet's earliest years, and free collecting all in one spot! 💎

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WHAT TO CUT

by Scott Empey

Dryhead Agate



Dryhead agate from Montana is an American classic. As a kid, I remember seeing perfectly polished 30x40 cabs in elaborate Western belt buckles proudly worn by old-school gentlemen rockhounds at the local shows and club meetings. It is one of those agates with such distinctive colors and patterns that it is instantly recognizable, like any good classic.

Dryheads are found in the Bighorn Canyon area of Montana, just north of the Wyoming border. The agate occurs in nodules with a surrounding matrix of dark-brown rhyolite or jasper. It is a banded agate, and typically the bands are broad, as compared with the finer banding found in other agates.

The color range is somewhat narrow, but the colors found are beautiful. Reds and oranges predominate, with lots of pink and white mixed in, but Dryheads can occasionally exhibit yellow, red, pink, gray and purple hues. The combination of the richly colored agate and the dark-brown matrix makes a stunning contrast.

Some nodules have drusy vugs or crystalline quartz centers, and occasionally the quartz centers will have suspended fortification patterns in the middle. Some even have amethyst centers, and these nodules are especially prized by collectors.

The deposit was originally discovered by agate collectors in the 1950s. Historically, the area was a Native American hunting ground, as evidenced by the bleached bison skulls found in the area, which gave the locality its name. The nodules were initially found as float, and after all the float had been picked up, it was eventually traced back to the source. Nodules had to be freed from surrounding shales, which required some hard hand digging. Many of the nodules you see today were hand-dug from claims like this as far back as the early 1960s.

Most of the nodules will have patterns of concentric bands around the center of

the cavity they formed in, but sometimes you can find pieces with a more mixed-up, sort of Crazy Lace pattern, with fingerlike patterns and eyes mixed in with sections of the dark-brown matrix. I am always on the lookout for pieces like this; the tighter patterns, combined with the contrast of the matrix, make especially nice cabochons.

Like most agates, Dryhead can have fractures and vugs that you will want to avoid when cabbing. I usually try to get material that has already been slabbed so I can see exactly what there is for me to work with. Slabs with a fracture or two are less expensive, and as long as any fractures are spaced out adequately, you can cut nice cabs from the spaces in between.

For some more insight into cutting from rough, I spoke with John Hurst, author of the book *Dryhead Agates* (2012), which features some stunning images of agates and lots of interesting information on the area. John brought up a important point: After making the first cut on a nodule, you come to a point where you have to make a decision on how to proceed.

If that first cut reveals a nodule with fractures, slab away and cut those cabs. However, if it reveals a gorgeous, fracture-free nodule with an amethystine suspended-fortification pattern, you probably don't want to slab that one. In fact, any fracture-free Dryhead nodule with a good pattern is likely to be more valuable intact than the stones that you can cut from it. It's a personal choice, really. To cut or not to cut, that is the question—but I will leave the answer up to you. 💎

Scott Empey, owner of Gerard Scott Designs, creates hand-cut gemstones, designer jewelry, and props for the motion picture industry. His Web site is www.gerardscottdesigns.com.



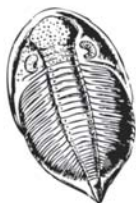
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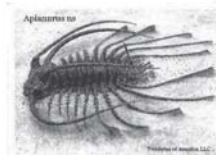
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dancooper@cinci.rr.com (513) 869-0226

MAPS 2015

BelOMO 10x Triplet Loupe



Belarusian Optical and Mechanical Association (BelOMA)

10 times magnification ratio

Bonded optical lens

Achromatic triplet

Focal distance:

1.1 inch; 28 mm

Linear field of view:

0.67 inch; 17 mm

Size: 1.54 x 1.1 x 0.98 inch;

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Weight: 2.1 oz.; 0.06 kg.

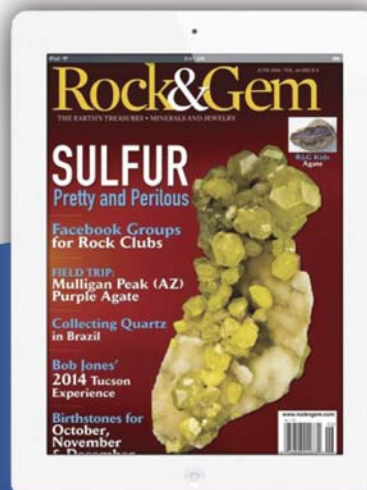


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The SULFOSALT GROUP

Part II: Arsenic/Antimony Minerals Based on Silver

Story by Bob Jones

The sulfosalt group consists of complex sulfide minerals that contain one of two poisonous natural, nonmetal elements, arsenic or antimony, as well as one metal element, usually copper, lead or silver. (The term “salt” refers to metal salts, ionic compounds that result when a metal is immersed in an acid bath.) Part I of this article covered those that depend on copper or lead as the positive metal element. This article will deal with those that are based on silver as the main metal element.



BOB JONES PHOTO/GROBEN COLLECTION

Lustrous black stephanite crystals contrast nicely with light-brown siderite on this Pribam, Bohemia, specimen.

We often refer to the elements arsenic and antimony as “metalloids”. They straddle the dividing line between the metals, on the left side of the periodic table, and the nonmetals, on the right side of the table. This means the metalloids have some of the properties of a metal and some properties of a nonmetal.

These elements combine with a metal—usually silver, iron or copper—and the non-metal sulfur to form sulfosalt compounds. Other elements can be a part of the chemistry of some sulfosalts, but these species tend to be very uncommon and of little interest to most collectors.

Sulfosalts tend to form in low-temperature environments, much to the delight of miners. When an ore deposit is opened, if these low-temperature sulfosalts are encountered first, they are easily mined and smelted and aid in the financial success of the venture. This makes possible the later mining of high-grade ore.

This is particularly important in silver deposits, since silver sulfosalts are rich in the white metal, which makes a mining venture profitable early on. Unfortunately, this also means the fine sulfosalts appear early in the deposit, and as mining extends into the earth, fewer and fewer sulfosalts are encountered and the supply dries up. This suggests to collectors that fine sulfosalt specimens are not as readily available as they were in the early days of mining in this country.

For instance, reports tell us about lovely red proustite crystals literally hanging off wire silvers like ornaments in the early days of mining the Comstock Lode of Nevada. Where are they now? I’ve never even seen one. When was the last time you saw a recently mined fine proustite or pyrargyrite? The days of abundant sulfosalts are long gone and we have to depend on old collections and museum stock to provide us with such specimens these days.

Only the silver mines in Mexico, including Naica, San Martin, and Fresnillo, continue to yield a sulfosalt specimen now and again because deep weathering in the dry desert environment has reached as far as 1,500 feet deep. These mines do yield a good pyrargyrite now and again as mining explores fresh ground.

The sulfosalts that do not contain silver are not unimportant, for they are sometimes readily available to collectors, and

BOB JONES PHOTO/GROBEN COLLECTION



This specimen with lustrous pyrargyrite crystals from Andreasberg (Harz), Germany was formerly in the Carl Bosch collection, one of the great collections of German minerals.

BOB LAVINSKY VIA WIKIMEDIA COMMONS



The Dolores I mine at Chañarcillo, Chile, produced proustite crystals in parallel arrangement that formed nearly solid masses, but were terminated at both ends.

ROCK CURRIER VIA WIKIMEDIA COMMONS, D/WILBUR COLLECTION



The finest crystal specimens of polybasite undoubtedly came from the now-abandoned Las Chipas mine at Arispe (Sonora), Mexico.

some are exceedingly desirable and eagerly sought. They are a significant part of displays at shows and in museums. But of all the sulfosalts, those containing silver are not only an important ore of silver, but a very significant addition to any public or private collection.

There are more than 15 sulfosalts containing silver as a significant element in their composition. Of these, less than a half-dozen were found in great enough quantities that they are still sought by collectors. These include pearceite, polybasite, proustite, pyrrargyrite, stephanite and friesebenite, the last of which is the rarest of this group.

There are other silver-rich minerals that are not sulfosalts. They include acanthite, dyscrasite, hessite and stromeyerite. These silver-containing sulfides lack arsenic or antimony, so they do not belong in this article. Pyrrargyrite and proustite are the darlings of the sulfosalt brigade. Their bright-red color, their showy crystals, their silver content, and their rarity all work together to raise them above the rest of the sulfosalts in appeal and value. In today's collector market, they command amazing prices. If these two silver minerals have an Achilles heel, however, it is their sensitivity to bright light. This causes them to darken over time until their lovely red color, so bright in proustite and so subtle in pyrrargyrite, is lost.

You may remember that silver compounds were used for generations in photography because they darken on exposure

to light. This property made it possible to produce negatives from which to make black-and-white prints. Kodak built a very valuable industry on that one property of silver compounds.

When either species has darkened you can still see a glint of red in thin slivers of the mineral. This helps identify a suspected dark proustite or pyrrargyrite. The loss of color does not happen quickly, but it is inevitable. This explains why many museums and private collectors keep proustite and pyrrargyrite specimens in a box or drawer, only displaying them briefly, if at all.

Of all the sulfosalts, it is very unlikely the average collector will be able to afford one of these red-hued silver beauties, as their cost has risen to astronomical heights. For that reason, I doubt any dealer would mislabel one of these red lovelies unless all its color is lost. That's when the thin sliver test can help find one of these valuable species.

Some years ago, Bill Panczner, his son Chris, my son Evan, and I visited the silver mines of San Martin and Fresnillo, both of which were fine silver producers. We were hoping to get some nice sulfosalt specimens for the Arizona Sonora Desert Museum, of which Bill was curator and I served on the Board of Governors. As we watched ore coming out of the mine depths on a conveyor, we asked our engineer guide if they ever got nice sulfosalt crystals. He mentioned pyrrargyrite and said they often did get good crystals.



TERRY WALLACE VIA WIKIMEDIA COMMONS

The greatest source of proustite was the Dolores mine at Chanarcillo (Copiapó Province), Chile.

We got all excited at the prospect of obtaining some specimens, but he soon killed that idea when he said they had none to sell or trade. It seems they saved these silver-rich specimens so that, any time the silver ores ran a bit lean and production numbers dropped off, they could toss them into the mix to boost the numbers. Imagine tossing crystals worth hundreds, maybe thousands, of dollars into the smelter to recover the ounce or two of silver they contain.

The greatest source of these minerals, especially proustite, was the Dolores mine at Chanarcillo, Chile. Small vugs lined with these minerals were mined out, and many of the specimens were saved. Some of the crystals reached over 4 inches in length, and most were a pointed scalenohedral shape.

Some groups consisted of proustite crystals in a parallel arrangement that formed nearly solid masses, but were terminated at both ends. There are few museums today that can't boast fine examples of Dolores mine proustite, and in some cases pyrrargyrite. Fortunate is the collector who has one or both of these beauties in a collection today. Dolores mine specimens came on the market long after German silver mines hit borrasca or adversity.



The exceptional stephanite from the St. Andreasberg District (Harz Mountains) of Germany is a sharp thumbnail with lustrous, metallic crystals to 1 cm long.



This proustite from the St. Andreasberg District (Harz Mountains) of Germany still exhibits remnants of its deep red color.

The Germany silver mines were rich in these two minerals, and we still see an occasional specimen for sale today. These come from an old collection that is being liquidated, or are released from a museum collection as surplus or in trade.

The first German silver mine was found well over 1,000 years ago, so the ores have been mined out and the specimens dried up. The initial discovery of silver in Germany was made by accident when a horse pawed the ground, exposing a vein of metal.

The largest proustite crystals found in Europe came from the Joachimov area of Bohemia and reached over 10 inches in length. Joachimov was originally called Joachimthal, and coins struck in silver from here we called *thalers*, which morphed into our word "dollar".

Colorado mines produced quantities of both pyrrargyrite and proustite, but when those mines were operating, collecting was a decided luxury; every scrap of silver-bearing ore had to go to the smelter to keep the operations going. The Molly Gibson mine, in Aspen, was noted for producing huge quantities of massive sulfosalt ores, which accounted for its richness. Many of the early Colorado mines, including Leadville, produced quantities of sulfosalts, but mineral collecting was not practiced much in those early days.

Some years ago, I inherited a small collection that contained a remarkable Colorado specimen of massive, solid proustite.

It had been mined around 1900 and had been preserved, even displayed in a local library for some time. It was also written up in a publication, which indicates that it was rather unusual. Luckily, it was not on display for long, and when not exposed

Pyrrargyrite forms along with proustite in a low-temperature environment. Few, if any, pyrrargyrite crystals are fresh out of the ground these days. The exception has been those from the Mexican mines mentioned, as they have provided fine, lustrous, hexagonal, blocky, 2-inch crystals with blunt terminations and deep red color.

Polybasite is a silver copper antimony sulfide that can be found in much the same type of environment as proustite and pyrrargyrite. It was found infrequently in the silver mines of Colorado and Idaho. It was often found during silver mining in Germany, but what we see from there came out of the ground at least a century ago.

The finest crystal specimens of polybasite undoubtedly came from the now-abandoned Las Chipas mine at Arispe (Sonora), Mexico. This remarkable property produced a wonderful suite of silver minerals, including acanthite, stephanite and polybasite, when it operated late in the 1800s. It was particularly productive before World War I. According to Panczner, in his book *Minerals of Mexico* (Van Nostrand, 1987), in 1908 a huge crystallized specimen of polybasite was mined at Las Chipas. It weighed about 65 pounds and ended up in the New York Museum of National History. Those of you living in the Eastern United States might be able to see this beauty on a visit to the museum.

While I was helping Bill with his book on Mexico, we visited Arispe and found a

There are *more than*
15 sulfosalts contain-
ing *silver* as a
significant element
in their composition.

was wrapped in black velvet preserving its redness. The piece ended up with a noted Denver dealer, Mitch Gunnell, who sold it to a friend in Connecticut around 1946. It spent the next 60 years wrapped in black velvet until it came to me, still a fine red color, in the inherited collection.

BOB JONES PHOTO/JONES COLLECTION



Topped with a small cluster of proustite, this complex cluster of pyrrargyrite crystals is from Andreasberg, Germany.

BOB JONES PHOTO



These fine red proustite crystals from the Dolores mine at Chanarcillo, Chile, are kept in a covered box at Harvard's Peabody Museum.

most interesting fact. The camp was abandoned save for a watchman. The bell in the church in Arispe is made of silver from the mine, a gift from the grateful mine owner to celebrate his good fortune. At the time of our visit, the church was guarded and we never heard the bell chime!

Pearceite is another sulfosalt silver mineral whose best specimens came from the Las Chipas mine. It was also found in Germany and in several American mines, including the Molly Gibson in Aspen, but you never see crystals from these sources today. The crystals from Las Chipas are typical flat, monoclinic crystals that take on a tabular, almost hexagonal, form. They developed in parallel, flowerlike clusters with crystals seldom reaching over an inch across. The only place you'll see pearceite crystals these days is in a museum.

Stephanite is a silver antimony sulfide species. It is a black mineral that forms very late in the deposits in which it is found. The crystals are orthorhombic and tend to be tabular and elongated. The crystal faces show striations, which help identify it. Twinning is also a guide, as it often forms pseudohexagonal disklike crystals that are quite attractive.

Stephanite is fairly common, having been found in quantity in many European mines. Příbram, Bohemia, is very well noted for superb stephanite crystals associated with galena, tetrahedrite, and other sulfides. Andreasberg, Germany, is a well-known source for stephanite, but production ceased long ago and nothing is available today. These include mines in Cornwall, England; Kongsberg, Norway; Chile and Bolivia. The crystals from the Las Chipas mine were exceptionally large for the species, but are also no longer available.

The importance of including discussions of minerals like stephanite and pearceite lies in the possibility of coming across a misidentified specimen at a show and having the good fortune and skill to recognize a "sleeping" specimen, as we call such specimens. Keep in mind that many of the Mexican mines are still operating, so the potential for fine silver sulfosalts still exists. In spite of the circumstances in Mexico, some dealers still manage to go there and obtain what is available. Those dealers deserve your support, as they really do take a risk when traveling south of the border. After years of enjoying mineral collecting in Mexico, I no longer venture there.

It should be noted here that galena—a common lead sulfide—though not a sulfosalt, is sometimes a source of silver simply because a few silver-bearing minerals are easily combined within the galena structure. This ability of minerals to mix is called miscibility, and one sulfosalt in particular, matildite, has been identified as intermixed with galena. Matildite is a relatively uncommon silver bismuth sulfide that is not easy to identify. Its presence in galena makes some lead deposits worth more than the lead they contain.

It is commonly assumed among collectors that galena crystals that have a crystal form other than the simple cube may contain some silver. Apparently, the silver atoms tend to influence the final crystal form of the galena. I have only read one study that verifies this, but silver in galena is a known fact.

Adding sulfosalts to your collection is not easy. They are pricey, uncommon, and eagerly sought by collectors of means. Knowledge of each species is the key to finding a potential specimen. Carefully studying what is offered for sale just may prove fruitful. Good hunting! ♦

Admission \$5.00, Children 12 and under free with paying adult; Jewelry- Gemstones-Minerals-Fossils-Displays-Demonstrations • Door Prizes ; contact Mike Mowen, 5979 Altenwald Rd., Waynesboro., PA 17268, (717) 264-9024; e-mail: mlmo@innet.net

21-22—MISSOULA, MONTANA: 21st Annual Gem, Mineral, and Fossil Show = Gems of Montana; Hellgate Mineral Society, Hilton Garden Inn; 3720 North Reserve Street, 406 532 5300; Sat. 9-6, Sun. 10-5; \$2.00, under 14 free; contact Bob Riggs, 14 Holiday Lane, Missoula, MT 59801, (406) 543-3667

27-28—ADA, OKLAHOMA: Annual show; Ada Gem, Mineral and Fossil Club, Ada, Oklahoma; 1710 N Broadway; Fri. 8am-6pm, Sat. 9am-5pm; Admission is FREE; The show will feature various demonstrations and displays of fluorescent rocks, minerals, fossils, lapidary and jewelry. Silent auctions of materials donated by dealers and members will be held hourly. Special Kids' Events: Fossil Dig, also The Petting Zoo. Dealers from the surrounding states (Oklahoma, Kansas, Arkansas, & Texas); contact Ed Vermillion, P.O. Box 782, Purcell, OK 73080, (405) 527-6431; e-mail: okieed42@windstream.net; Web site: <http://www.freewebs.com/agmfc/index.htm>

27-28—ADA, OKLAHOMA: Annual show; Ada Gem, Mineral & Fossil Club, Ada, Oklahoma; N.E. corner of intersection of St. Hwy. 99 (U.S. 377) and Richardson Bypass (St. Hwy 1 & 3E); Fri. 8 am-6 pm, Sat. 9 am-5 pm; Admission is FREE; The show will feature various demonstrations and displays of fluorescent rocks, minerals. Silent auctions of materials donated by dealers and club members will be held hourly. Special kids events: Fossil dig and a petting zoo. Dealers from the surrounding states (Oklahoma, Kansas, Arkansas and Texas). Admission is FREE; contact Ed Vermillion, P.O. Box 782, Purcell, OK 73080, (405) 527-6431; e-mail: okieed42@windstream.net; Web site: <http://www.freewebs.com/agmfc/index.htm>

27-29—SPOKANE, WASHINGTON: 56th Annual Gem, Jewelry & Mineral Show; Rock Rollers Club of Spokane, Spokane County Fair & Expo Center; N. 604 Havana, at Broadway; Fri. 10-6, Sat. 10-6, Sun. 10-4; adults \$6, seniors and military \$5, children (12 & under) free; the incredible lapidary artistry of Olive Cohour, more than 40 dealers, 60 display cases, fossils, crystals, gemstones, minerals, specimens, handcrafted jewelry, lapidary supplies and demonstrations, hourly door prizes, youth activities, grand prize; contact David Rapp, (509) 891-6533; e-mail: show-chair@rockrollers.org

27-29—SANDY, UTAH: Wholesale and retail show; Gem Faire Inc, South Towne Expo Center; 9575 S State St; Fri. Noon-6pm, Sat. 10am-6pm, Sun. 10am-5pm; Admission \$7, Children Free (ages 0-11); Fine jewelry, precious & semi-precious gemstones, millions of beads, crystals, gold & silver, pearls, minerals & much more at manufacturer's prices. Exhibitors from around the world. Jewelry repair & cleaning while you shop. Free hourly door prizes.; contact Yoyo Nelson, (503) 252-8300; e-mail: info@gemfaire.com; Web site: <http://www.gemfaire.com>

27-29—INDIANAPOLIS, INDIANA: Annual show; Treasures Of The Earth Gem & Jewelry Shows, Indiana State Fairgrounds, Agriculture/Horticulture Bldg.; 1202 E. 38th St.; Fri. 10-6, Sat. 10-6, Sun. 11-5; adults \$5 for 3 days, children (under 16) free; beads, pearls, gemstones, gem trees, wire wrapping, wire sculpture, silversmiths and goldsmiths, custom work and repairs while you wait, door prizes, classes available, Western jewelry; contact Van Wimmer Show Director, 5273 Bradshaw Rd., Salem, VA 24153, (540) 384-6047; e-mail: van@toteshow.com; Web site: www.toteshow.com

27-29—HICKORY, NORTH CAROLINA: 45th Annual Unifour Show and 2015 Eastern Federation Convention; Catawba Valley Gem & Mineral Club, Hickory Metro Convention Center; 1960 13th Ave. Dr. SE, I-40, Exit 125; Fri. 9-6, Sat. 9-6, Sun. 10-5; adults \$4, students and children free; dealers, exhibits, hourly door prizes, hands-on children's activities, cabbing, faceting and wire wrapping demonstrations. "Somewhere in the Rainbow" exhibit; contact Baxter Leonard, 2510 Rolling Ridge Dr., Hickory, NC 28602, (828) 320-4028; e-mail: gailandbaxter@aol.com; Web site: cvgmc.org/

27-29—HAMPTON, VIRGINIA: Annual show; Treasures of the Earth, Inc, Hampton Roads Convention Center; 1610 Coliseum Dr; Fri. 12 pm-Noon-6 pm, Sat. 10 am-5 PM, Sun. 10 am-4 pm; Adults \$5.00, military free with ID, Children 16 and under free; Vendors from across the US bring their merchandise to you. You will find • 14K and sterling silver, classic, estate, fashion and handmade jewelry • Loose stones, beads and findings, pearls • Mineral specimens, crystals, lapidary supplies • Books, carvings and gift items Displays and demonstrations by local rock & gem societies; contact Jane Westbrook, PO Box 59, Gloucester Point, VA 23062, (804) 285-4281; e-mail: jane@treasuresoftheearth.com; Web site: www.treasuresoftheearth.com

27-29—LOVELAND, COLORADO: Annual show; Fort Collins Rockhounds, The Ranch; Larimer County Fairgrounds, Thomas M. McKee Building; Fri. 4:00 pm-8:00 pm, Sat. 9:00 am-6:00 pm, Sun. 10:00 am-5:00 pm; Admission \$4/day, \$7/3-

day, Students 12-18 w/ID \$1, Children Free with adult; This year's exhibits feature Colorado Minerals. Metro State University will host a hands-on rock identification educational experience. Door prizes, mineral specimen grab bag sales, children's activity table, demonstrations and the silent auction are ongoing. Gem and mineral dealers sell everything from rockhounding equipment and ore-grade specimens to fine jewelry and stone beads.; contact Dave Halliburton, 2506 Pear Court, Fort Collins, CO 80521, (970) 493-6168; e-mail: fcrockhounds@yahoo.com; Web site: www.fortcollinsrockhounds.org

28-28—MIDDLEBORO, MASSACHUSETTS: auction; Southeastern Massachusetts Mineral Club, Inc., Mitchell Memorial Club; 29 Elm St., corner Elm St. & Rt. 44; Sat. 10:30 AM-3:30 PM; Admission Free; Auction is Saturday, March 28, 2015; contact Jim Gaudet, 67 Benson St., Middleboro, MA 02346, (508) 946-0558; e-mail: rocks2gems@verizon.net; Web site: www.semmc.com

28-29—PLYMOUTH MEETING, PENNSYLVANIA: Annual show; Philadelphia Mineralogical Society, The Philadelphia Paleontological Society, LuLu Temple; 5140 Butler Pike; Sat. 10-5, Sun. 10-4; adults \$5, children (under 12) \$1; special exhibits by the Academy of Natural Sciences and the Leidy Microscopical Society, fossils, minerals, gems, speakers, exhibits, fossil dig, Kids' Mineral Corner, door prizes, Scouting Merit Badge information; contact Karenne Snow, (609) 353-4101; Web site: www.philamineralsociety.org

28-29—CEDAR RAPIDS, IOWA: Annual show; Cedar Valley Rocks & Minerals Society, Hawkeye Downs; 400 6th St. SW; Sat. 8:30-6, Sun. 9:30-5; adults \$3, students \$1, children and groups with adult leader free; educational programs, silent auctions, demonstrations, displays, door prizes, kids' activities, gem sluice, dealers, minerals, fossils, gems, jewelry, tools, equipment, lapidary supplies; contact Marv Houg, (319) 364-2868; e-mail: m_houg@yahoo.com; Web site: www.cedarvalleyrockclub.org

28-29—ANTHEM, ARIZONA: Annual show; Daisy Mountain Rock and Mineral Club, Diamond Canyon School; 40004 N. Liberty Bell Way; Sat. 9:00 AM-5:00 PM, Sun. 9:00 AM-5:00 PM; Admission \$3.00, Seniors \$2.00, Students \$2.00, Children under 12 free; 30 dealers; gems, minerals, fossils, fluorescent, jewelry, beads, wire trapping, geodes, raffles, kids events; contact Ed Winbourne, (623) 444 4634; e-mail: ewinbourne@gmail.com

28-29—SAYRE, PENNSYLVANIA: Annual show; Che-Hanna Rock & Mineral Club, Athens Twp. Fire Hall; 211 Herrick Ave.; Sat. 9-5, Sun. 10-4; adults \$3, students \$1, children (under 8) free; museum displays, kids' activities, geode cutting, UV program, dealers, minerals, fossils, gems, lapidary, jewelry; contact Bob McGuire, 224 Church St., Lopez, PA 19628, (570) 928-9238; e-mail: uvbob@epix.net; Web site: www.chehannarocks.com

28-29—ROSEVILLE, CALIFORNIA: 53rd Annual Show; Roseville Rock Rollers Gem & Mineral Society, Roseville (Placer County) Fairgrounds; 800 All America City Blvd. (off Washington), four buildings, plus outside grounds; Sat. 10-5, Sun. 10-4; adults \$6 (discount coupon on Web site), seniors \$5, children (12 and under) free with adult; educational activities, kids' "Education Station", exhibits, more than 50 dealers, crystals, fossils, minerals, beads, gemstones, gold panning, mining equipment, meteorites, polished stones, jade, opal, world-class mineral specimens, tourmaline, gold, petrified wood, lapidary demonstrations, silent auctions, free mineral and gem ID, raffle prizes, door prizes, lapidary shop open house, rain or shine; contact Gloria Marie, PO Box 452, Roseville, CA 95661, (916) 216-1114; e-mail: gloriarosevillerockrollers@gmail.com; Web site: www.rockrollers.com

28-29—SWEET HOME, OREGON: 67th Annual Gem and Mineral show; Sweet Home Rock and Mineral Society, Sweet Home High School Gym; 1641 Long Street; Sat. 10-6, Sun. 10-5; Admission .50 c; contact Joe Cota, PO Box 2279, Sweet Home, OR 97355, (541) 451 2740

28-29—NORTHAMPTON, MASSACHUSETTS: Western Mass Mineral, Jewelry, and Fossil Show; Connecticut Valley Mineral Club, Clarion Hotel & Conference Center; 1 Atwood Dr.; Sat. 9:30-5, Sun. 10-4; adults \$5, children (12 and under) free with adult, Scouts in uniform free; more than 19 dealers, minerals, crystals, jewelry, gems, lapidary, free exhibits, free mineral specimen for children; contact Lee Champigny, (413) 320-9741; Web site: www.westernmassmineralshow.com or www.cvmmineralclub.org

28-29—DOTHAN, ALABAMA: Annual show; Dothan Gem and Mineral Club, Houston County Farm Center; 1701 Cottonwood Road; Sat. 9:00-5:00, Sun. 10:00-4:00; Admission is Free; Minerals, rocks, fossils, jewelry, Kids' activities. Door Prizes. Silent Auction. Fun for the whole family. Free admission and free parking.; contact Jeff DeRoche, 121 W. Crawford St., Dothan, AL 36301, (334) 673-3554; e-mail: arlambert@comcast.net; Web site: www.wiregrassrockhounds.com

28-29—BELLINGHAM, WASHINGTON: 54th Annual Rock & Gem Show; Mt. Baker Rock & Gem Club, Bloedel Donovan Community Center; 2214 Electric Avenue; Sat. 10-6, Sun. 10-5; Admission is Free; Show includes gold panning and lapidary demonstrations, fluorescent show, rocks, minerals, fos-

sils, gems, jewelry, club sales and dealers. Also door prizes, scholarship raffle, silent auction, exhibits, food service, special activities for kids, and more; contact Tracy Jackson, (360) 366-0576; e-mail: tracyljackson@comcast.net; Web site: www.mtbakerrockclub.org

28-29—DOTHAN, ALABAMA: Annual show; Dothan Gem and Mineral Club, Houston County Farm Center; 1701 East Cottonwood Road; Sat. 9:00 am-5:00 pm, Sun. 10:00 am-4:00 pm; Admission is Free; Rocks, gems, minerals, fossils, beads, jewelry, Kids' activities. Silent Auction. Door Prizes. Free Admission. Free Parking.; contact Jeff DeRoche, 121 W. Crawford St., Dothan, AL 36301, (334) 673-3554; e-mail: arlambert@comcast.net; Web site: www.wiregrassrockhounds.com

28-29—MONROE, WISCONSIN: Annual show; Badger Lapidary & Geological Society, Inc., Monroe Senior High School; 1600 26th Street; Sat. 9 AM-5 PM, Sun. 9 AM-5 PM; Admission is Free; Badger Lapidary & Geological Society, 45th Annual, Rock, Gem, Mineral, & Fossil Show. Ten dealers, excellent speakers, many beautiful club displays, fluorescent mineral tent, lapidary demonstrations, club sales table, hourly door prizes, educational films. Activities for kids: Fishpond, spinner game, scavenger hunt, quarry quest, rock polishing, and roving rock wizard. Food: Full Menu. Free Show - Free-will donation and free parking.; contact Teri Marche, 5415 Lost Woods Ct., Oregon, WI 53575, (608) 835-2653; e-mail: tmarche555@gmail.com; Web site: www.badgerrockclub.org

28-29—LEXINGTON, KENTUCKY: Show and sale; Blue Grass Gem and Mineral Club, Clarion Hotel; 1950 Newton Pike; Sat. 10:00 AM-6:00 PM, Sun. 11:00 AM-5:00 PM; Admission \$2, Children \$1; Lexington Rock Gem and Jewelry Show Sponsored by Blue Grass Gem and Mineral Club in conjunction with Rockhounds of Central Kentucky March 28-29, 2015 Clarion Hotel, Lexington, KY located near Exit 115 off I-75/64 at 1950 Newton Pike Show includes minerals, jewelry, equipment dealers, exhibits, KY Agate, fluorescent display, prizes, and auctions. Admission: \$2 Adults, \$1 Children, \$5 Max for Family, Scouts in uniform free.; contact Allen Ferrell, (859) 277-2469; e-mail: kyrock2010kentucky@yahoo.com; Web site: www.bggamc.homestead.com

28-29—ANGELS CAMP, CALIFORNIA: Annual show; Calaveras Gem and Mineral Society, Calaveras County Fairgrounds; 101 Frogtown Rd; Sat. 10 am-5 pm, Sun. 10 am-4 pm; Admission \$4.00, Children 12 & under Free with paying adult; CALAVERAS GEM & MINERAL SHOW 2015 Calaveras Gem and Jewelry Show, Calaveras County Fairgrounds (Frogtown) Sat. March 28, 2015, 10am - 5 pm & Sun. March 29, 2015, 10am - 4pm. Admission is \$4 for adults; kids 12 & under are free, if accompanied by a paying adult. There will be numerous exhibits featuring jewelry, carvings, faceted gemstones and polished rocks. There will be demonstrators in disciplines such as faceting gemstones, wire wrapping, chain fabrication, flint knapping and hard rock carving. KIDS AREA has activities and hands on projects. Dealers will be there who sell jewelry making supplies, tools, beads, minerals, gemstones, handcrafted jewelry, meteorites, fossils, books, etc. Snack Bar on site. Free parking and a shuttle service from fairground gate up to the show building. For more information, visit www.calaverasgemandmineral.org, or contact Robin Williams 209-728-8277 or e-mail amy95247@yahoo.com. Submitted by: Anna Christiansen achrist361@sbcglobal.net; contact Robin Williams, PO Box 1135, Murphys, CA 95247, 209-728-8277; e-mail: amy95247@yahoo.com; Web site: calaverasgemandmineral.org

28-29—TORRANCE, CALIFORNIA: Annual show; South Bay Lapidary & Mineral Society, Ken Miller Recreation Center; 3341 Torrance Blvd. (enter on Madrona Avenue); Sat. 10am-5pm, Sun. 10am-4pm; Admission is FREE; 66th Annual Show; South Bay Lapidary & Mineral Society Show "Nature's Treasures" Free admission; Artisan's Gift Shop, fluorescent mineral exhibit, demonstrations, children's activities, prize drawings, door prizes, slabs, lots of rough rock, used equipment, books, magazines, silent auction, and visit Kay's Kitchen for the best chili and desserts in town. Show Chairs: Richard Egger and Andrea Fabian. Contact Richard at (310) 291-9855 if you have a question. Hope to see you there!; contact Kathy Polliard, (310) 533-4931; e-mail: kjpollard@yahoo.com

28-29—DES PLAINES, ILLINOIS: Annual show; Des Plaines Valley Geological Society, Des Plaines Park District Leisure Center; 2222 Birch Street; Sat. 9:30 am-5:00 pm, Sun. 10:00 am-4:00 pm; Adults \$3.00, Seniors \$2.00, Students \$1.00 with ID, Children under 12 free; Kids room, live demonstrations, educational exhibits, food, raffles, silent auction, fine gem, mineral, fossil and jewelry dealers, Gold panning For information or directions call Frank Lavin 815 298-9178; contact Lois Zima, (847) 298-4653

28-29—CENTRAL POINT, OREGON: Annual show; Roxy Ann Gem & Mineral Show, Jackson County Expo; 1 Peninger Road; Sat. 9 am-5 pm, Sun. 10 am-4 pm; Admission \$5.00, Seniors \$3.00, Students \$2.00, Children under 6 Free; Demonstrations, Dealers and De-accessioned Museum Auction Saturday only after show 5:30 pm; contact Jani Walkins, 316 S Peach St, 74, Medford, OR 97501, (541) 646-5782; e-mail: orrock-girl58@gmail.com; Web site: www.craterrack.com

The Jaspers of Biggs Junction

Oregon Basalt Flows Harbor Nodules

Story and Photos by Jim Landon

A couple times each year,
my wife, Kerry, and I
make a pilgrimage

from our country home near Co-
wiche, Washington, to visit our
long-time friends in LaPine, Ore-
gon. Each time, we drive down

U.S. Highway 97, crossing into
Oregon over the Columbia River
and passing through the town of
Biggs Junction. The vast canyon
the river has cut through multiple
basalt flows stands witness to the
powers of water erosion over mil-
lions of years. Layer upon layer of
flood basalts stand in stark vertical
columns, each one delineating a
separate volcanic event.



This 14-pound nodule of polished Deschutes jasper shows why it is one of the finest types of picture jasper in the world.



The view of the Columbia River and the basalt cliffs on the Oregon side that host the jasper deposits is spectacular.

After crossing the bridge at Biggs Junction, we head up a long, winding canyon that snakes its way from the river to the endless wheat fields that now crown the last of the flood basalt events. Hundreds of wind turbines harness the ceaseless wind that blows through the canyon, cut by the Columbia River through the Cascade Mountains to the west of Biggs Junction. When the weather is just right, sailboarders can be seen zipping back and forth on the river, dwarfed by the enormity of the canyon and the sheer basalt cliffs.

The Columbia River Flood Basalts, as they are named, also harbor one of the most desirable types of picture jasper that can be found anywhere in the world. This material occurs as nodular masses and seams at several places in the Biggs Junction area. Each outcrop has specific characteristics that allow aficionados to distinguish between them, but the depositional environment for all of the different types seems to be similar.

The jaspers are known by several different names, depending on where they were mined. There is Blue Biggs, Fulton Canyon Biggs, Blue Sky Biggs, Purple Biggs, and Deschutes jasper; the last is named after the river canyon in which it was discovered. There is also what locals call “new Biggs”, which I guess refers to any material that has been mined more recently.

In its heyday in the 1960s and '70s, Biggs jasper was sold worldwide by a small group of miners who worked their claims and marketed their material at rock shows and shops they ran. Hoot Elkins is reported to have made the modern discovery of the Deschutes jasper deposit, which had initially been found and worked by local Native American tribes for making tools and projectile points. He had a rock shop in Prineville, Oregon, that was taken over by his daughter Judy, who de-



Blue Biggs tends to have wider, more dispersed patterns and a background that is somewhat blue-gray.



Rounded basalt pillows and yellow palagonite were associated with Biggs jasper in this cavity in a U.S. Highway 97 road cut.



This quarry, opened up about a mile from the classic Deschutes jasper site a few years ago, yielded only uniform gray to black jasper.



These Blue Biggs cabochons, made by Mike Hahn, show the patterning that make this material so desirable.

cided to close it a few years back and retire. The names of other miners like Isami Tsubota, Fred Dormier, and Howard Dolph come up frequently in discussions about the jaspers from the Biggs Junction area.

I was fortunate to meet Howard at his shop and museum outside of Rufus, Oregon. Howard's museum contained the very best specimens from his many years of collecting. To me, the most outstanding specimen was a beautiful piece of Biggs jasper with a well-preserved fossil fish embedded in it. Since he passed away, his shop has been closed, and the status of his museum is unknown.

The source of the basalt that filled Central Washington and parts of Northern Oregon is a story in itself. During the middle Miocene period, a stretching and thinning of the continental crust in southeast Washington and northwest Oregon gave rise to one of the most spectacular flood basalt events in geologic history. Where the Blue Mountains now stand, thousands of north-south trending narrow fissures opened up, spewing vast volumes of hot, fluid basaltic lava periodically over several million years. The lava gradually filled an extensive basin in what is now central Washington.

The first of these events, called the Imnaha flood basalt flow, started around 17 million years ago and buried the lowlands of central Washington. It was followed by an even greater eruptive series that deposited the Grande Ronde flood basalts (16.5 million years ago), burying most of the Imnaha flows and traveling all the way to the Pacific Ocean following the path of the ancestral Columbia River. In the area of Biggs Junction, the Grande Ronde basalt flow buried a landscape that had a series of shallow lakes and marshes under several hundred feet of molten lava. Where the basalt came into contact with standing water, two characteristic features can be found: pillows and palagonite.

Pillow basalts form from the quick cooling of lava that extrudes into water. As the magma emerges from the fissure, its surface hardens into a shell. Pressure from the continuously flowing lava cracks the shell, allowing another lava bubble to form and harden. The process repeats indefinitely, producing a succession of rounded formations that resemble pillows. A modern example can be seen in Hawaii where flows from the frequent eruptive events of Kilauea volcano enter the ocean.

Palagonite is an alteration product that forms when there is a chemical reaction between water and molten basalt. The basalt changes into a yellow-green, claylike material that often forms narrow bands around the pillows.

The jasper deposits of the Biggs Junction area are often associated with these features, indicating that they formed from interaction between the flood basalts and sediments found in the standing bodies of water.

When you leave Biggs Junction and head south on U.S. Highway 97, you drive up the canyon formed by Spanish Hollow Creek. Spanish Hollow Creek is at best an intermittent stream because it is bone dry most of the year. It has been reported that, in 1964, a flood event took out the existing road and exposed a treasure trove of Biggs jasper that had been eroding out of the canyon walls for millions of years. The road was long since repaired, and vestiges of the seams that produced the jasper can still be seen in the canyon walls.

On a recent trip to research this article, I parked in a pullout near the exposures and walked down the road to where a series of deep cavities can be seen in the cliff wall. At one time, these had held large masses of jasper, embedded in yellow palagonite and surrounded by the characteristic shapes of pillow basalts. These cliffs are constantly shedding rocks and boulders as a result of frost action and weathering, so I would recommend caution if you are in the area and decide to stop and take some photos.



New Biggs tends to have a lighter background with less distinct pattern. The texture of the rough is also grainier than that found in either Deschutes jasper or Blue Biggs.

An abandoned quarry in this area once produced Blue Biggs. Nothing now remains of the seams the miner was following, and the old quarry blends into the surrounding landscape. Like this quarry, the others that had produced Biggs and Deschutes jaspers are now closed. The Deschutes jasper quarry is now part of a state park at the mouth of the Deschutes River.

The jaspers of the Biggs Junction area are hard to come by these days. The only places they were found were in side canyons that lead to the Columbia River. I believe that the deposits of this material are probably quite extensive, but with several hundred feet of solid basalt concealing them in most places, access is out of the question. Public access is also questionable, as most of the surrounding land is privately owned.

To my knowledge, the only deposit that is actively being mined is located in China Hollow outside the town of Wasco. A few years ago, I wrote about a quarry being mined by Don Hilderbrand in this canyon. At that time, Don was finding some material that resembled Biggs jasper, along with multicolor agate, using a large track-hoe. Unlike the traditional Biggs jasper outcrops, this deposit is a continuous band of an old paleosol (lithified soil) that can be traced for some distance along the sloping canyon wall. There are indications that a basalt flow inundated standing bodies of water in the China Hollow deposit because the agatized fragments of aquatic vegetation are sometimes found associated with the agate seams. Don offers collecting trips to his quarry for no charge, and participants pay by the pound for what they find.

Every once in a while, a rumor about the children or grandchildren of someone who had mined Biggs selling off rough circulates in the rock world of the Northwest. These



The quarry that produced Deschutes picture jasper is now just a grass-covered depression and is now part of an Oregon state park.



These Deschutes jasper cabochons, made by Mike Hahn, are just a few of those he has in his extensive collection.

are usually just rumors. When you do find examples for sale, they are usually slabs that have been procured by dealers from old collections or finished cabochons.

A few years ago, when Judy Elkins decided to close her rock shop and sell her inventory, there was a mad rush by collectors to purchase everything she had. Numerous polished, high-end Biggs and Deschutes jasper specimens were sold during the event, which was held at the same time as the annual Madras, Oregon, rock show.

I can only imagine what it must have been like to be around during the heyday of Biggs

Junction jasper mining. Those who made the discoveries are mostly gone now, leaving behind an oral history and an incomplete written history of what was found, where it was found, and by whom. It has been left up to those with a passion for discovery to seek out and record that history. It is also up to the passionate few to research where the quarries used to be and, hopefully, re-open those that still hold a hidden treasure of picture jasper. In the meantime, we who are fortunate enough to possess specimens of these fine picture jaspers can continue to share our treasures with others. 💎

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Show Dates from page 59

April 2015

3-5—EUGENE, OREGON: Wholesale and retail show; Gem Faire Inc, Lane County Events Center; 796 W 13th Ave; Fri. Noon-6pm, Sat. 10am-6pm, Sun. 10am-5pm; Admission = \$7, Children Free (ages 0-11); Fine jewelry, precious & semi-precious gemstones, millions of beads, crystals, gold & silver, pearls, minerals & much more at manufacturer's prices. Exhibitors from around the world. Jewelry repair & cleaning while you shop. Free hourly door prizes.; contact Yooy Nelson, (503) 252-8300; e-mail: info@gemfaire.com; Web site: <http://www.gemfaire.com>

4-5—CHICO, CALIFORNIA: Show and sale; Paradise Gem & Mineral Club, Silver Dollar Fair Grounds; 2335 Fair St.; Sat. 10-5, Sun. 10-4; adults \$3, children (under 16) free; "Petrified Wood": 48 display cases, free specimens for the first 200 children; contact Manuel Garcia, 6659 Foster Rd., Paradise, CA 95969, (530) 877-7324; e-mail: mmpg@att.net

4-5—POCATELLO, IDAHO: Annual show; South East Idaho Gem and Mineral Society (SEIGMS), Bannock County Fairgrounds; 10588 Fairground Drive; Sat. 10 am-6 pm, Sun. 10 am-5 pm; Adults \$2.00, Children 12 and under free with adult; contact Larry Manhart, (208) 406-3990; e-mail: Luv2huntrucks@gmail.com

4-5—LINCOLN, NEBRASKA: Annual show; Lincoln Gem and Minerals Club, Inc., Lancaster Event Center; 84th and Havelock Ave, Lincoln Room; Sat. 9:00 AM-6:00 PM, Sun. 10:00 AM-5:00 PM; Admission = \$5.00, Children 11 and under free with adult; Adult 2 day PASS \$9.00. Dealer Space FULL. Educational Programs daily. Gem Digs Discover the Beauty of Rock.; contact James Marburger, 334 Locust, Box 64, Hickman, NE 68372, (402) 430-6703; e-mail: jm24122@windstream.net; Web site: www.lincolngemmineralclub.org

9-11—WYOMING, MICHIGAN: Annual show; Indian Mounds Rock & Mineral Club, Rogers Plaza Town Center; 972 28th St. SW; Thu. 9:30-9, Fri. 9:30-9, Sat. 9:30-7; free admission; dealers, minerals, fossils, gems, jewelry, beads, rough, equipment, books, displays, demonstrations, children's table; contact Don Van Dyke, 4296 Oakview, Wyoming, MI 49519, (616) 669-6932; e-mail: donvandyke@tm.net; Web site: www.indianmoundsrockclub.com

10-12—ORLANDO, FLORIDA: Annual Spring Gem, Mineral and Bead Show; Central Florida Mineral & Gem Society, National Guard Armory; 2809 S. Fern Creek Ave.; Fri. 1-6, Sat. 10-6, Sun. 10-5; adults \$5 (\$1 off coupon on Web site), students \$2, Scouts free; demonstrations, cabochon cutting, faceting, wire wrapping, flint knapping, metal work, 30-minute auctions, kids' table, sluice mining for gems, hourly door prizes, gems, minerals, beads, metaphysical stones, fossils, Scout merit badges; contact Paul Hayes, 1400 Sawyerwood Ave., Orlando, FL 32809, (407) 816-1229; e-mail: phayes3@cfl.rr.com; Web site: www.cfmgs.org

10-12—HILLSBORO, OREGON: Wholesale and retail show; Gem Faire Inc, Washington County Fairgrounds; 873 NE 34th Ave; Fri. Noon-6pm, Sat. 10am-6pm, Sun. 10am-5pm; Admission \$7, Children Free (ages 0-11); Fine jewelry, precious & semi-precious gemstones, millions of beads, crystals, gold & silver, pearls, minerals & much more at manufacturer's prices. Exhibitors from around the world. Jewelry repair & cleaning while you shop. Free hourly door prizes.; contact Yooy Nelson, (503) 252-8300; e-mail: info@gemfaire.com; Web site: <http://www.gemfaire.com>

10-12—ABBOTSFORD, BRITISH COLUMBIA, CANADA: Annual show; British Columbia Lapidary Society, Ag. Rec. Center; 32470 Haida Dr., Canada; Fri. 10 am-8 pm, Sat. 10 am-6 pm, Sun. 10 am-6 pm; Admission \$ 6, Students \$ 2, Children under 6 free; club displays, demos, 25,000 sq. ft., new tailgate sale; contact Cam Bacon, (604) 854-1711; e-mail: show-chaircam@yahoo.com

10-12—VISTA, CALIFORNIA: Annual show; Vista Gem and Mineral, Antique Gas and Steam Engine Museum; 2040 N. Santa Fe Ave.; Fri. 10 am-5 pm, Sat. 10 am-5 pm, Sun. 10 am-5 pm; Admission is Free; Free Parking and admission to museum during show; contact Ray Pearce, (760) 535-5524; e-mail: ray-rocks@cox.net

10-12—EDISON, NEW JERSEY: Annual show; Eons Expos, LLLP, NJ Convention & Expo Center; 97 Sunfield Avenue; Fri. 12 pm-6 pm; Admission \$10.00, Students \$5.00, Children Free; Mindat.org Lecture Series, huge UV Mineral Exhibit in the Junior Ballroom, Viewing Stone exhibit, sluicing for the kids, regional club displays, demonstrations, and more activities & exhibits added closer to show time.; contact Lowell Carhart, 80 Roslyn Forest Lane, Charlottesville, VA 22901, (804) 291-6357; e-mail: LowellCarhart@yahoo.com; Web site: www.NY-NJ-Show.com

10-12—OGDEN, UTAH: Annual show; Golden Spike Gem & Mineral Society and NFMS, Golden Spike Event Center, Weber County Fairground; 1000 N 1200 W, GPS: 1181 N Fairground Dr ;

Fri. 9:00 am-6:00 pm, Sat. 10:00 am-6:00 pm, Sun. 10:00 am-4:00 pm; Admission \$3.00 Donation, Students \$1.50 Donation, Children 12 and under and Scouts Free with an Adult; 63rd Gemstone Junction; Golden Spike Gem & Mineral Society; Donations: \$3.00 Adults, Children 12 and under Free with an Adult, Student \$1.50, and Scouts in uniform Free with their Leader. Over 25 Dealers, Displays, Exhibits (competitive and hobbyist), Demonstrations, Geode splitting, Door Prizes, Silent auction. Rocks, Minerals, Jewelry, Beads, Gemstones, Equipment, Supplies, Fossils, Wood, Findings, Gold panning, Knapping, and more. For the Young at Heart: Mr. Bones and his Walking Dinosaurs, Grab Bags, Wheel of Fortune, Sapphire screening, and more. Free Parking.; contact Marie or Les Tryon, (801) 782-5664 or (801) 528-8998

10-12—EDISON, NEW JERSEY: Annual show; Eons Expos, LLLP, NJ Convention & Exposition Center; 97 Sunfield Avenue; Fri. 12 pm-9 pm, Sat. 10 am-6 pm, Sun. 10 am-6 pm; Adults \$10, Students \$5, Children are Free; 400 vendor booths and 14,000 visitors makes this the largest Mineral, Fossil, and Gem Show east of the Mississippi River. The Mindat.org Speaker Series' will feature presenters from around the world. A huge display of glowing UV minerals from all major sites on Earth will be featured in our darkened Junior Ballroom (presented by the Franklin Mineral Museum and Sterling Hill Mining Museums). Activities for the kids include sluicing, and every child over 5 will receive a UV rock upon entry -- so they will want to rush to the UV room to see in which color that it glows. A 2,000 sq foot section in the middle of the show will highlight large specimens of dinosaurs and other fossilized life. For business-to-business transactions, there will be a separate 20,000 sq. ft. "Wholesale Only" section. Entry is \$10 for those over 12 years old, just \$5 for kids between 5 and 12, and under 5 are free. Parking is free. The full-service cafeteria can seat 100 people at a time.; contact Hethar Grana, 235 First Avenue, Keyport, NJ 07735, (973) 903-3256; e-mail: Heather@EonsExpos.com; Web site: <http://www.NY-NJ-GemShow.com>

11-12—MARIPOSA, CALIFORNIA: Annual show; CA State Mineral Museum and Mariposa Club, Mariposa Fairgrounds; Highway 49 and Fairgrounds Rd.; Sat. 10:00-5:00, Sun. 10:00-4:00; Adults \$3, Seniors = Free, Students = \$2, Children = Free; Includes full access at no extra charge to California State Mining & Mineral Museum on the same property. See the giant Fricot gold nugget back on display this year.; contact Martin Foden, (209) 742-4036; e-mail: martin@safarigold.com; Web site: <http://www.camineralmuseum.com>

11-12—YAKIMA, WASHINGTON: 54th Parade of Gems; Yakima Rock & Mineral Club, Central Washington State Fair Grounds; Modern Living Building, 1301 S. Fair Ave.; Sat. 10-6, Sun. 10-4; adults \$3.50, seniors and students \$2, children (under 12) free with adult; displays, dealers, rough rock, finished jewelry, specimens, lapidary equipment, demonstrations, cabbing, wire wrapping, silent auction, door prizes, raffle, spin the wheel, grab bags, gold panning; contact Marti Sondgeroth, 2013 S. 41st Ave., Yakima, WA 98903, (509) 248-6401; e-mail: marthams@q.com

11-12—MARION, ILLINOIS: Annual show; Southern Illinois Earth Science Club, Pavilion of the City of Marion; 1602 Sioux Dr.; Sat. 10-6, Sun. 10-5; adults \$2, children (18 and under) free; gems, minerals, fossils, lapidary, fluorescent light shows, door prizes, silent auctions; contact Mike Chontofalsky, 1019 E. Broadway, Centralia, IL 62801, (618) 532-0455; e-mail: chontofalsky@att.net; Web site: siesclub.org

11-12—ABILENE, TEXAS: Show and sale; Central Texas Gem & Mineral Society, Abilene Civic Center; N. 6th and Pine; Sat. 10-6, Sun. 10-4; adults \$3, students (6-12) \$1.50, children (under 6) and Scouts in uniform free; exhibits, Wheel of Fortune, dealers, fossils, rare minerals, cut and uncut gems, fluorescent display, lapidary supplies and rough, jewelry making equipment, beads, crack your own geode, silent auction, door prizes, grand prize drawing; contact Kay H. McDaniel, 3118 Woodglan Cove, Abilene, TX 79606, (325) 668-8558; e-mail: kmcdaniel23@suddenlink.net; Web site: rockclub.txl.net

11-12—JOHNSON CITY, NEW YORK: Annual show; New York Southern Tier Geology Club, Johnson City Senior Citizens Center; 30 Brockton St.; Sat. 9-5, Sun. 10-4; adults \$3, children (under 12) free; club exhibits, silent auctions, dealers, minerals, fossils, gems, lapidary, jewelry; contact Tom Ogden, 96 Main St., Bainbridge, NY 13733, (607) 967-8552; e-mail: tandjogden@stny.rr.com

11-12—ORANGE, CONNECTICUT: Annual show; New Haven Mineral Club, Amity Middle School; 100 Ohman Ave., off Rte.34; Sat. 9:30-5, Sun. 10-5; adults \$5, children free with adult; minerals, gems, jewelry, fossils, exhibits, dealers, door prizes, lectures, demonstrations; contact Art Doyle; e-mail: president@newhavenmineralclub.org; Web site: newhavenmineralclub.org

11-12—CANTON, OHIO: Annual show; Stark County Gem & Mineral Club, Stark County Fairgrounds; 305 Wertz Avenue NW; Sat. 9 am-5 pm, Sun. 10 am-5 pm; Admission = Adults \$5, Seniors \$4, Students \$1, Children under 6 free; Silent Auctions every 15 minutes, displays, lapidary supplies, kids games, fluorescent mineral display, demonstrations, rock and mineral specimens, jewelry makers, national dealers, gemstones, etc.; contact Elise Dougan; e-mail: donelisedougan@gmail.com

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11-12—DOVER, NEW HAMPSHIRE: Annual show; Southeastern New Hampshire Mineral Club, Veteran's Community Center; 156 Backwater Road; Sat. 10 am-4 pm, Sun. 10 am-4 pm; Adults \$3.00, Children under 12 Free if accompanied by an adult; ; contact LARRY HEATH, 20 Ash Drive, Kingston, NH 03848, (603) 642-8601; e-mail: heathlg@comcast.net; Web site: www.senhmc.org

11-12—COLUMBUS, OHIO: Annual show; Columbus Rock and Mineral Society, Licking County Rock and Mineral Society, Northland Performing Arts Center; 4411 Tamarack Blvd.; Sat. 10:00 am-6:00 pm, Sun. 11:00 am-5:00 pm; Adults \$7.00, Seniors \$6.00, Students \$3.00, Children under 6 Free; 2015 theme: Frozen: Ohio's Ice Age. Scouts in Uniform and Teachers with a school ID are free. Large children's area with dozens of educational exhibits, children's games and educational activities. Special speakers at 1:00 and 3:00 Pm Saturday and 2:00 Pm Sunday. Free specimen ID booth, demonstrations, hourly and grand door prize, case exhibits, silent auction and large dealer variety. ; contact Craig Kramer, 628 Sanbridge Circle E., Columbus, OH 43085, (614) 436-4511; e-mail: craig.kramer@wowway.com; Web site: www.columbusrockandmineralsociety.org

11-12—SILOAM SPRINGS, ARKANSAS: Annual show; Northwest Arkansas Gem and Mineral Society, Community Building of Siloam Springs Arkansas; 115 S Mount Olive; Sat. 9:00am-5:00pm, Sun. 10:00am-4:00pm; Adults \$3, Seniors \$3, Students \$2, Children Free under 8; Like us on Facebook; contact Dave Leininger, 14029 White Oak Lane, Bentonville, AR 72712, (479) 721-1579; e-mail: hulagrub@aol.com; Web site: www.nwarockhounds.org

17-19—SAN DIEGO, CALIFORNIA: Wholesale and retail show; Gem Faire Inc, Scottish Rite Center; 1895 Camino del Rio S.; Fri. Noon-6pm, Sat. 10am-6pm, Sun. 10am-5pm; Adults \$7, Children Free (ages 0-11); Fine jewelry, precious & semi-precious gemstones, millions of beads, crystals, gold & silver, pearls, minerals & much more at manufacturer's prices. Exhibitors from around the world. Jewelry repair & cleaning while you shop. Free hourly door prizes.; contact Yooy Nelson, (503) 252-8300; e-mail: info@gemfaire.com; Web site: http://www.gemfaire.com

17-19—RICKREALL, OREGON: Show, ; Willamette Agate & Mineral Society, Polk County Fairgrounds; 520 S. Pacific Hwy. West; Fri. 9-6, Sat. 10-6, Sun. 10-4:30; adults \$2, children (under 12) free; contact Etheleen Flippo, (503) 623-4241; e-mail: reflip-poo@hotmail.com

17-19—ALPINE, TEXAS: Show and sale; Chihuahuan Desert Gem & Mineral Club, Alpine Civic Center; 801 W.Holland Ave. (Hwy.90); Fri. 9:00 am-6:00 pm, Sat. 9:00 am-6:00 pm, Sun. 10:00 am-4:00 pm; FREE Admission!; contact Judith Brueske, PO Box 1111, Alpine, TX 79831, (432) 244-9503; e-mail: jbrueske@sbcglobal.net

18-18—SEVERNA PARK, MARYLAND: Annual show; Patuxent Lapidary Guild, Earleigh Heights VCF Fire Hall; 161 Ritchie Hwy.; Sat. 10-5; adults \$1, children (under 10) free; "Kids' Corner", dealers, fossils, minerals, cabochons, rough rock and slabs, jewelry; contact Donna Madej, 181 Chelsea Rd., Pasadena, MD 21122, (410) 215-1774; e-mail: littlewings@mdonline.net; Web site: www.patuxentlapidary.org

18-18—STILLWATER, OKLAHOMA: Rock swap; Oklahoma State Council of Mineralogical Societies, Couch Park pavilion; 12th Ave & Perkins Road; Sat. 10:00am-4:00pm; Admission is Free; Like us on Facebook; contact Dave Leininger, 14029 Whiye Oak Lane, Bentonville, AR 72712, (479) 721-1579; e-mail: hulagrub@aol.com; Web site: www.oklahomamineralsocieties.org

18-19—PINECREST, FLORIDA: Show and sale; Miami Mineralogical and Lapidary Guild, Evelyn Greer Park; 8200 SW 124 Street; Sat. 10:00 am-6:00 pm, Sun. 10:00 am-6:00 pm; Adults \$4.00, Seniors \$4.00, Students \$4.00, Children Free; MMLG Spring GEM, MINERAL, FOSSIL, AND JEWELRY Show at Evelyn Greer Park - just half-a-block off US 1 in Pinecrest - with plenty of free parking. There will be exhibits, demonstrations, displays, raffles, and vendors - as well as educational activities for both children and adults: jewelry-making, grab-bags, gem mining, geode splitting.; contact Sandy Mielke, 2434 Swanson Avenue, Miami, FL 33133, (305) 858.6967; e-mail: webguy@mmlg-inc.org; Web site: www.miamirockandgem.com

18-19—KENNEWICK, WASHINGTON: Annual show; Lakeside Gem & Mineral Club, Benton County Fairgrounds; 1500 South Oak; Sat. 10-5, Sun. 10-4; adults \$5, children (12 and under) free; dealers, demonstrations, silent auction, junior activities, door prizes, displays; contact Mary Lou Omstead, PO Box 6652, Kennewick, WA 99336, (509) 783-2798

18-19—LANCASTER, PENNSYLVANIA: Annual show; North Museum of Nature and Science, The Farm and Home Center; 1383 Arcadia Rd.; Sat. 10-6, Sun. 10-5; adults (12 and over) \$5; door prizes, educational demonstrations and lectures, children's activities; contact Alison Mallin, 400 College Ave., Lancaster, PA 17602, (717) 358-7188; e-mail: amallin@north-museum.org

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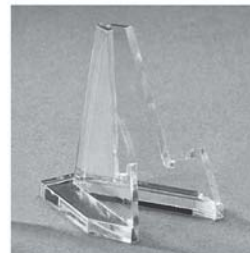
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TUMBLE with the MASTERS

Join a Worldwide Rock Tumbling Contest



Contestants get a 3-pound bag of rough rock to tumble and submit their five best stones for judging.

This past September, at the Feather River Lapidary & Mineral Society (FRLMS) Rock and Gem Show in Chico, California, I noticed a small group of people gathered in front of our tumbling contest display. A tall man with dark sunglasses was beaming and literally jumping up and down. What in the world was he so excited about?

Noel Runyan stood with his arm around his wife, Debby, showing off his tumbled rocks to his family. They had traveled over three hours to see the winning stones in the 2014 Worldwide Rock Tumbling Contest sponsored by the FRLMS. Noel and his teammate, Gerald Perko, from Freemont, California, had won second place.

Noel, a retired electrical engineer and computer specialist, does the “grunt part” by grinding away at the stones—or as his wife jokes, “making dirt”. He has owned a tumbler for about 30 years, but only got serious about tumbling over the last four or five years. He and his partner won honorable mention in the contest in 2013 and moved up two notches to second place with their tumbled Brazilian agate in 2014.



An expert judge closely examines a contestant's tumbled stone for scratches.

For the past five years, FRLMS has collected hundreds of pounds of rocks while on field trips, sledged the rough into smaller pieces, boxed it up, and shipped it to contest applicants. Tumblers have come out to compete from far and wide: California, New York, Indiana, Minnesota, Tennessee, New Mexico, Australia and Canada.

I love seeing the rock go into a tumbler and then watching beautiful stones come out weeks to months later. Every stone tumbler takes different steps and has a unique process to get their results. As a novice rockhound and brand-new tumbler, I thought my meeting with Noel was the perfect time to get some advice from a master tumbler.

Noel recommended, "Be gentle on the stones. Overfill the barrel. Most people say don't overfill the barrel because it slows [the process] down. But it slows down because you are being more gentle on the stones. Be patient and gentle, put in media like beads or ceramic pellets."

I have personally heard of people putting all kinds of strange things in their tumbler: Ivory® soap, Spic and Span®, borax, distilled and rain water, leather straps to mix aluminum oxide with cerium oxide, rice and honey, to name a few.

Within each 3-pound box of rocks sent to applicants, the club includes an information sheet for the contestant to fill out, describing each "stage" of their tumbling experience. This must be returned with the contestant's five best finished stones.

When the best tumbled rocks are returned, the judges, who have a combined total of 60 years of "rocking" experience, get down to work. It takes several days of examination with a loupe and a lot of note taking to whittle the entries down to the top seven contenders and then determine the winners.



First-place winners receive \$250 prize money and have their name etched in the club's crystal trophy.

The top three entries are put on display at the club's annual rock show. More than 3,000 visitors to the Chico rock, gem and jewelry show, held the third weekend of September, have the opportunity to see the first-, second- and third-place winners. The



Some of the obsidian collected in Northern California for the 2015 contest has a purple hue.

winners not only receive bragging rights, but also cash prizes of \$250, \$100 and \$50, respectively. The name, state and year of the first place winner is etched into the club's crystal trophy, which is displayed in the tumbling case at the show.

Noel says that he doesn't have the secrets of the masters, but his biggest tip is to "keep the stones from banging real hard so you don't get the micro pits. Micro pits trap dirt and other dust. They make the stones look 'rashy' on the curved surfaces."

Contestants in the 2015 tumbling contest will receive rough obsidian from Northern California that the club has collected on field trips. To join in on the fun and take on an amazing challenge, with the possibility of winning a bit of cash and bragging rights, visit www.FeatherRiverRocks.org for an application. Submit the application and the \$30 entry fee by June 1. Entrants must complete their tumbling and choose their top five stones in time to return them for judging by August 15.

Submit your application early to guarantee your spot in the Worldwide Rock Tumbling Contest! 💎



The top three tumblers' rocks will be displayed at the FRLMS's September rock show.

18-19—EAU CLAIRE, WISCONSIN: Annual show; Chippewa Valley Gem & Mineral Society, Eau Claire County Expo Center; 5530 Fairview Drive; Sat. 9:00 AM-5:00 PM, Sun. 10:00 AM-4:00 PM; Admission is FREE, Free, Free, Free; Kids' Activities & Crafts - Demonstrations - Shopping - Silent Auction - Fluorescent Mineral Displays - Rock Collections - Rock Spheres Demonstration - Wire Wrap Jewelry - Rock Cutting & Capping - Jewelry & Gemstones - Mineral Specimens - Agates & Geodes - Fossils & Petrified Wood - Rock Art & Carvings - Beads & Supplies - Copper & Silver Finds - Crystal & Amethyst - Books & Rough Rock - (Near the corner of I-94 & Highway 93); contact Paul Tubbs, 619 Van Buren Street, Eau Claire, WI 54703-6061, (715) 834-5747; e-mail: bizpam1@charter.net

18-19—IDAHO FALLS, IDAHO: 51st Annual Gem and Mineral Show; Idaho Falls Gem and Mineral Society, Idaho Falls Recreation Center; B Street; Sat. 10 am-6 pm, Sun. 10 am-5 pm; Admission = \$3.00, Children under 12 free; contact Tom Strong, PO Box 2362, Idaho Falls, ID 83403, (337) 384 6820

18-19—SAN JOSE, CALIFORNIA: Annual show; Santa Clara Valley Gem & Mineral Society, Santa Clara County Fairgrounds; 344 Tully Road; Sat. 10:00 am-5:00 pm, Sun. 10:00 am-5:00 pm; Adults \$6.00, Children Under 12 Free; 60th Annual Show and Festival. 50 dealers, Jewelry, Fossils, Beads, Jade, Petrified Wood, Polished Agate, Kids Area, Demonstrations, Displays, Fluorescent Mineral Tent, Flintknapper, Door Prizes, Diamond Raffle, Gold Panning and much more. \$1 off coupon on the website.; contact Frank Mullaney, (408) 265-1422; e-mail: info@scvgms.org; Web site: www.scvgms.org

18-19—WALNUT CREEK, CALIFORNIA: Show and sale; Pacific Crystal Guild, Civic Park Community Center; 1375 Civic Drive; Sat. 10:00 am-6:00 pm, Sun. 10:00 am-4:00 pm; Adults \$8, Children Free; We're at it again! This fall season, we're bringing over 35 vendors to Walnut Creek. The Civic Park Community Center in downtown Walnut Creek will be filled with crystals, minerals, beads, jewelry - lots of massaging, psychic readings, aura photos, and much more. Lots of minerals and fossils for the kids to look at while the parents get a massage and an aura photo. Some will come for a few hours while others will spend the whole weekend. Something for everyone!!; contact Jerry Tomlinson, PO Box 1371, Sausalito, CA 94966, (415) 383-7837; e-mail: jerry@crystalfair.com; Web site: www.crystalfair.com

18-19—THOUSAND OAKS, CALIFORNIA: Annual show; Conejo Gem & Mineral Club, Borchard Park Community Center; 190 Reino Road at Borchard Road; Sat. 10:00 AM-5:00 PM, Sun. 10:00 AM-5:00 PM; Admission is FREE; 41st Annual Pageant of a Thousand Gems: Fun for all ages with exhibits and sales of gems, jewelry, rocks, minerals and fossils, Special youth activities. Lapidary & Jewelry making demonstrations. Silent auction, door prizes, plant sale and snack bar. FREE admission and parking.; contact Robert Sankovich, 1961 Havenwood Drive, Thousand Oaks, CA 91362, (805) 494-7734; e-mail: rmsorca@roadrunner.com; Web site: www.gamc.org

21-23—IRVINE, KENTUCKY: Annual Kentucky Agate Hunt; Mountain Mushroom Festival, Estell County School's Central Office Gym; 253 Main St.; Tue. 9-4, Wed. 9-4, Thu. 9-4; \$10 per day; all-day Kentucky agate hunt, easy- or rough-terrain trips each day; contact Francine Bonny, Irvine City Hall, 101 Chestnut St., Irvine, KY 40336, (606) 723-1233; e-mail: mushroomfestival@irvineonline.com; Web site: www.mountainmushroomfestival.org

24-26—IRVINE, KENTUCKY: Annual show; Mountain Mushroom Festival, Agate, Gem & Mineral Show, Estell County School's Central Office Gym; 253 Main St., (enter at the back of the gym); Fri. 9-6, Sat. 9-6, Sun. 10-5; free admission; agates, gems, rocks, fossils, minerals, demonstrations, dealers; contact Francine Bonny, Irvine City Hall, 101 Chestnut St., Irvine, KY 40336, (606) 723-1233; e-mail: mushroomfestival@irvineonline.com; Web site: www.mountainmushroomfestival.com

24-26—GRANTS PASS, OREGON: Annual show; Rogue Gem and Geology Club, Josephine County Fairground Pavilion; 1451 Fairground Rd; Fri. 9:00-5:00, Sat. 9:00-5:00, Sun. 10:00-4:00; Admission is \$1.00, Children 11 and under free; Rock, fossils, gems, jewelry, dealers, door prizes, club sale, silent auction, raffle, demonstrations, exhibits, kid's games and family fun. Friday Admission is FREE Contact: Mary 541-862-2989 or Janet 541-415-1720; contact Janet Fields, 378 Dexter Way, Grants Pass, OR 97527, (541) 415-1720; e-mail: jmfilds88@yahoo.com; Web site: www.rogueandgeology.org

24-26—VIRGINIA BEACH, VIRGINIA: Retail show; Treasures of the Earth, Inc., Virginia Beach Convention Center; 1000 19th St; Fri. 12 noon-6 pm, Sat. 10 am-5 pm, Sun. 10 am-4 pm; Adults \$5.00, military free with ID, Children 16 and under free; Vendors from across the US bring their merchandise to you. You will find • 14K and sterling silver, classic, estate, fashion and handmade jewelry • Loose stones, beads and findings, pearls • Mineral specimens, crystals, lapidary supplies • Books, carvings and gift items Displays and demonstrations by the two Gem & Mineral Societies in the area Appraisals available on site; contact Jane Westbrook, PO Box 59, Gloucester Point, VA 23062, (804) 285-4281; e-mail: jane@treasuresoftheearth.com; Web site: www.treasuresoftheearth.com

24-26—SANTA ROSA, CALIFORNIA: Wholesale and retail show; Gem Faire Inc, Sonoma County Fairgrounds; 1350 Bennett Valley Rd.; Fri. Noon-6pm, Sat. 10am-6pm, Sun. 10am-5pm; Admission \$7, Children are FREE (ages 0-11); Fine jewelry, precious & semi-precious gemstones, millions of beads, crystals, gold & silver, pearls, minerals & much more at manufacturer's prices. Exhibitors from around the world. Jewelry repair & cleaning while you shop. Free hourly door prizes; contact Yooy Nelson, (503) 252-8300; e-mail: info@gemfaire.com; Web site: http://www.gemfaire.com

24-26—WICHITA, KANSAS: Annual show; Wichita Gem & Mineral Society, Cessna Activity Center; 2744 George Washington Blvd.; Fri. 9-7, Sat. 10-7, Sun. 10-5; adults \$5, students \$1, children free; "Earth's Hidden Treasures": gemstone jewelry, crystals, beads, agates, polished stones, fossils, rocks, minerals, special children's programs and events; contact Gene Maggard, 8318 SE Highway 77, Leon, KS 67074, (316) 742-3746; e-mail: gandmaggard@gmail.com

24-26—PORTLAND, OREGON: 58th Annual Rock and Gem Show; Mt. Hood Rock Club, Kiever Memorial National Guard Armory; 10000 NE 33rd Drive, (just west of the PDX airport between NE Marine Dr. & NE Columbia Blvd.); Fri. 10-5, Sat. 10-5, Sun. 10-4; FREE - Donations appreciated!; one free rock for each child. 25 Vendors will be selling: minerals, rocks, beads, jewelry, fossils, crafts, equipment, tools and more. Activities will include: Kid's corner with games, Door prizes, Raffle prizes, Demonstrations in lapidary & wire wrapping, Silent auction bargains, Oral auction on Sunday at 1pm. Many Displays and Exhibits. ; contact L. Smith, 503 760 1825; e-mail: mhrcshow@gmail.com; Web site: www.Mthoodrockclub.com

24-26—DENVER, COLORADO: Wholesale and retail show; Martin Zinn Expositions, LLC, Ramada Plaza-Denver Central; 4849 Bannock St.; Fri. 10 am-6 pm, Sat. 10 am-6 pm, Sun. 10 am-5 pm; Admission is Free; contact Regina Aumente, PO Box 665, Bernalillo, NM 87004, (505) 867-0425; e-mail: mzexpos@gmail.com; Web site: www.mzexpos.com

25-26—TROY, OHIO: Annual show; Brukner Gem & Mineral Club, Miami County Fairgrounds; 650 N. Co. Road 25A; Sat. 10-6, Sun. 10-4; adults \$2, students and children free; dealers, grab bags, demonstrations, gold panning demonstrations, gem sluice, crystals, jewelry, rocks, fossils, silent auction; contact Judy Burton, 912 Kent Lane, Troy, OH 45373, (937) 339-1966; e-mail: jleeburton@woh.rr.com; Web site: www.bruknergemandmineralclub.com

25-26—ELMA, WASHINGTON: 47th annual Earth's Treasures Rock and Gem Show; Grays Harbor Gem and Geology Society, Grays Harbor County Fairgrounds; 43 Elma-McCleary Road; Sat. 10 am-5 pm, Sun. 10 am-4 pm; Admission is FREE!; contact Gary Emberley, 624 Fairmont Place, Aberdeen, WA 98520, (360) 533 6196; e-mail: melissa624@hotmail.com

25-26—SEATTLE, WASHINGTON: 49th annual show Earth's Treasures; West Seattle Rock Club, Alki Masonic Temple; 4736 40th Avenue SW; Sat. 10 am-5 pm, Sun. 10 am-5 pm; Admission is Free; contact Leroy Christensen, (206) 582 2267; e-mail: soundviewathome@comcast.net

25-26—CUYAHOGA FALLS, OHIO: Semi-annual show; Akron Mineral Society, Summit Lapidary Club, Emilio & Sons Expo Center; 48 E. Bath Rd.; Sat. 10-6, Sun. 10-5; adults \$5, seniors and students \$4, children (under 6) and Scouts in uniform free; 30 dealers, geodes, minerals, jewelry, beads, findings, slab material, lapidary equipment, silversmith work, gold findings, children's activities, gem tree making, gem mine, kaleidoscope, treasure hunt, demonstrations, gem ID, wire wrapping, cutting and polishing stones, faceting, displays, Ohio flint, member projects, Geo Juniors displays, silent auction, door prizes; contact Joyce Kish, 3014 Clarkmill Rd., Norton, OH 44203, (330) 753-7081; e-mail: gemboree@outlook.com

25-26—FRANKLIN, NEW JERSEY: Annual show; NJESA; Sterling Mine, Franklin School; 50 Washington Avenue; Sat. 9 am-5:30 pm, Sun. 10 am- 5 pm; Adults \$6, Children under 14 free; Outdoor Swap Saturday: 8 am-5pm Sunday 9 am-5 pm Fluorescent and White-Light exhibits Fluorescent mineral dealers; contact Russell Brarens, (973) 421-1045

25-26—MEMPHIS, TENNESSEE: Annual show; Memphis Archaeological and Geological Society, Memphis International AgriCenter, ; 7777 Walnut Grove Rd.; Sat. 9:00 am-6:00 pm, Sun. 10:00 am-5:00 p.m.; Adults \$5.00, Children \$2.00; Dealers, Exhibits, Demonstrations, Grand and Hourly door prizes. Kids Area with Rockzone featuring Gem Dig, Geode Bowling, and Rocks Around the Clock. Scouts in uniform Free; contact WC McDaniel, 2-38 Central Avenue, Memphis, TN 38104, (901) 274-7706; e-mail: info@theearthwideopen.com; Web site: www.TheEarthWideOpen.com,

25-26—SANTA CRUZ, CALIFORNIA: Annual show; Santa Cruz Mineral & Gem Society, Santa Cruz Civic Auditorium; Corner Church St. & Center St.; Sat. 10am-5pm, Sun. 10am-5pm; Admission \$5, under 12 free; This 64th annual show features a variety of gift items, rocks, minerals, fossils, jewelry, lapidary sup-

plies, tools, and MORE! There will also be Fun and Educational activities for kids as well as adults. Also included, a fluorescent mineral display, treasure wheel, rock painting, silent auction, demonstrations, lectures, and more! Doors open at 10 am. Admission is \$5. Children under 12 are free when accompanied by an adult as well as Scouts in uniform. Please visit www.scmgs.org for more information.; contact Show Chair, PO BOX 343, Santa Cruz, CA 95061; Web site: www.scmgs.org

25-26—FORT DODGE, IOWA: Annual show; River Valley Rockhounds Inc, Iowa Central Community College East Campus; 2031 Quail Ave., east edge of Fort Dodge; Sat. 9 am-5 pm, Sun. 11 am-4 pm; Adults \$1, \$2 family; displays, dealers, door prizes, free samples for kids; contact Robert Wolf, 3521 10th Ave. North, Fort Dodge, IA 50501, (515) 955-2818; e-mail: midnightwriter@frontiernet.net

25-26—LANCASTER, CALIFORNIA: Annual show; Antelope Valley Gem and Mineral Club, Lancaster High School; 44701 32nd St West; Sat. 10 am-5 pm, Sun. 10 am-5 pm; Admission is Free; Free parking, unique shopping, children's activities & silent auction; contact C.J. Quitoriano, (661) 209-9092; Web site: <http://avgem.weebly.com/>

May 2015

1-3—KALAMAZOO, MICHIGAN: Annual show; Kalamazoo Geological and Mineral Society, Kalamazoo County Expo Center; 2900 Lake St.; Fri. 4:00 pm-8:00 pm, Sat. 10 am-6 pm, Sun. 10 am-5 pm; Admission = \$3, Children under 12 free; 15 dealers, crystals, lapidary tools, rocks, slabs, minerals, jewelry, beads, cabochons, agates and meteorites. Demonstrators in silver smithing, faceting, beading and wire-wrapping. Show includes geode cracking, informational displays, silent auctions, specimen tables, mineral mine, free Petoskey stone polishing, participation from WMU and the Kalamazoo Astronomical Society, hourly door prizes and a grand prize drawing. Great family fun and learning for everyone from youth to senior!! Proceeds go to scholarships for WMU Geology students.; contact Jerry VanNocker, (269) 979 3348; e-mail: jerry@travelinginspain.com; Web site: KalamazooRockClub.org

1-3—LA HABRA, CALIFORNIA: Annual show; North Orange County Gem & Mineral Society, La Habra Community Center; 101 W. La Habra Blvd.; Fri. 5-8, Sat. 10-5, Sun. 10-5; free admission; dealers, demonstrators, exhibits, kids' games, projects and educational programs; contact Don Warthen, (626) 330-8974; e-mail: odwarthen@verizon.net; Web site: nccgms.com

1-3—MCPHERSON, KANSAS: 23rd Annual Sale and Swap; McPherson Gem & Mineral Club, McPherson 4-H Building; 710 W. Woodside; Fri. 9-6, Sat. 9-6, Sun. 10:30-3; free admission; dealers, minerals, fossils, gems, jewelry, lapidary work, hourly door prizes, kids' spin-n-win wheel, Saturday-evening auction; contact Kim Vasper, 1489 Janasu Rd., McPherson, KS 67460, (620) 755-5415; e-mail: kimvasper@sbcglobal.net

1-3—RICHMOND, VIRGINIA: Retail show; Treasures of the Earth, Inc., Richmond Raceway Complex; 600 E. Laburnum Ave; Fri. 12 noon-6 pm, Sat. 10 am-5 pm, Sun. 10 am-4 pm; Adults \$5.00, military free with ID, Children 16 and under free; Vendors from across the US bring their merchandise to you. You will find • 14K and sterling silver, classic, estate, fashion and handmade jewelry • Loose stones, beads and findings, pearls • Mineral specimens, crystals, lapidary supplies • Books, carvings and gift items Displays and demonstrations by the Richmond Gem & Mineral Society; contact Jane Westbrook, PO Box 59, GloucesterPoint, VA 23062, (804) 285-4281; e-mail: jane@treasuresoftheearth.com; Web site: www.treasuresoftheearth.com

2-3—ROSEBURG, OREGON: 45th Annual Show; Umpqua Gem & Mineral Club, Douglas County Fairgrounds; I-5 Exit 123; Sat. 9-5, Sun. 10-4; free admission; dealers, demonstrators, silent auction, raffles, door prizes, kids' activities; contact Sue Woodman, (541) 391-3347; e-mail: suew1952.sw@gmail.com

2-3—MARSHFIELD, WISCONSIN: Annual show; Heart of Wisconsin Gem & Mineral Society, Marshfield High School Fieldhouse; 1401 E Becker Rd.; Sat. 10:00 am-5:00pm, Sun. 10:00 am-4:00 pm; Admission is FREE; 42nd annual Gem, Mineral Fossil & Jewelry Show. Displays, dealers, kid's activities, continuous silent auctions, speakers, free admission, donations accepted.; contact Cynthia Kelman, 1403 N Broadway Ave, Marshfield, WI 54449, (715) 387-8782; e-mail: kelman@tznnet.com

2-3—LUBBOCK, TEXAS: Annual show; Lubbock Gem and Mineral Society, Lubbock Memorial Civic Center; 1501 Mac Davis Lane; Sat. 10:00 am-6:00 pm, Sun. 10:00 am-5:00 pm; Adults \$4.00, Seniors \$3.00, Students \$2.00, Children Under 6 Free; 57th Annual Gem, Mineral, Fossil, Bead and Jewelry Show and Sale; Dealers, Demonstrators, Exhibits, Silent Auction, Hourly Door Prizes, Fluorescent Mineral Display, Kid's Games, Grab Bags, Classic & Contemporary Handmade Jewelry, loose Stones, Rough, Cabs, Slabs, Geodes, Beads, Minerals, Jewelers, Wire Wrappers, lapidary demonstrations, Adult Grand Prize, Junior Grand Prize.; contact Walter Beneze, (806) 797-5832;

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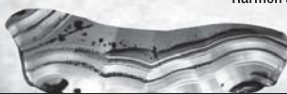
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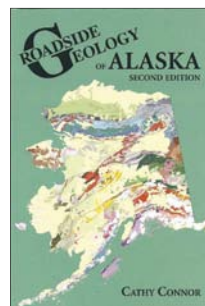
Roadside Geology of Alaska

by Cathy Connor

Alaskan geography is the result of an active tectonic environment—from time immemorial through today. Soaring mountains and deep offshore troughs are the result of the uplift and subduction caused by continental plate movement, and frequent earthquakes and the occasional volcanic eruption provide assurance that the process is ongoing.

Since the book was first published in 1988, significant geological events have taken place and new interpretations of data have been made, prompting this second edition.

Starting with the breakup of Pangaea (Paleozoic), Connor traces the landmass' climatic evolution from a warm, tropical environment in which marine reptiles thrived (Cretaceous), to a sub-Arctic setting (Pleistocene through Anthropocene), in which glacial action has been a major influence on topography. She then delineates the visible evidence of these geological stages that can be seen at numerous points throughout the state. The 317 pages are generously illustrated in color and include a detailed index.



—Lynn Varon

\$26 (Mountain Press Publishing Co., www.mountain-press.com)

Dreher Gemstone Carvings at GIA

More than 20 intricately carved and lifelike animal sculptures by world-renowned gemstone carvers Gerd and Patrick Dreher are on exhibit at the Gemological Institute of America (GIA) world headquarters in Carlsbad, California. "Generations of Mastery: Gemstone Carvings by Dreher" opened Feb. 19 and will be on view through summer 2015.

The Dreher family, whose legacy dates back five generations, is part of the 600-year gemstone carving tradition in Idar-Oberstein, Germany, a major center for the cutting and carving of gems.

The pieces exhibited are on loan from the Larson family of Fallbrook, California. Bill Larson, owner of Pala International, is a well-known collector and connoisseur of gems, minerals and carvings.

GIA's museum is free and open to the public Monday through Friday and reservations are required. E-mail guestservices@gia.edu, call (800) 421-7250 ext. 4116 or (760) 603-4116, or visit www.gia.edu.



Dinosaurs without Bones

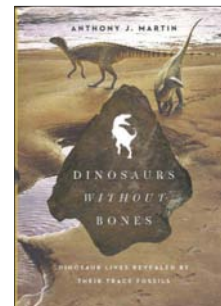
by Anthony J. Martin

Paleontologists have learned a lot about the dinosaurs that inhabited Earth millions of years ago from their fossilized bones. In this book, Martin explores how trace fossils can add detail to the story of the "terrible lizards." "And storytelling," he writes, "is what ichnology is all about."

Trace fossils include tracks, nests, burrows, toothmarks, feces, and stomach contents that have been preserved through fossilization. Martin shares how scientists extrapolate theories about the animals' diets, mating habits, parenting techniques, living conditions, interactions, and other characteristics from this evidence. Comparing the behavior of modern animals to that of their ancient ancestors, as indicated by trace fossils, gives additional insights.

Not all trace evidence is small enough to be studied in a lab; these enormous animals altered the very landscape by the simple expedient of moving across it and influenced the development or destruction of flora and fauna.

The 460-page book gives a fairly readable explanation of complex scientific data, weaving the various interpretations into a narrative format that lets the reader's imagination bring the ancient beasts to life. It contains 24 pages of illustrations and extensive footnoting.



—Lynn Varon

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Show Dates from page 58

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2-3—WACO, TEXAS: Annual show; Waco Gem and Mineral Club, Extraco Events Center; 4601 Bosque Blvd.; Sat. 9:00 am-6:00 pm, Sun. 11:00 am-5:00 pm; Adults \$5, Students \$1, Children \$1; contact Andrew McDonald, Stephanie Robert, 3039 Spring Valley Rd., Lorena, TX 76655, (254) 366-3846; e-mail: babydcmac@aol.com; Web site: www.facebook.com/WacoGemAndMineralClub

2-3—EVERETT, WASHINGTON: 62nd Annual Gem, Jewelry, & Mineral Show; Everett Rock & Gem Club, Everett Community College; Student Fitness Center, 2206 Tower Street; Sat. 10 am-6 pm, Sun. 10-5; Admission is Free; Dealers, demonstrations, door prizes, raffles, drawings, kids' activities, silent auction, exhibits and displays, food; contact Fritz Mack, PO Box 1615, Everett, WA 98206, (425) 232 0809

2-3—LUBBOCK, TEXAS: Annual show; The Lubbock Gem and Mineral Society, Lubbock Memorial Civic Center; 1501 Mac Davis Lane; Sat. 10:00 am-6:00 pm, Sun. 10:00 am-5:00 pm; Adults \$4, Seniors \$3, Students \$2, Children are Free; 57th Annual Gem, Mineral, Fossil, Bead and Jewelry Show and Sale; Dealers, Demonstrators, Exhibits, Silent Auction, Hourly Door Prizes, Fluorescent Mineral Display, Kid's Games, Grab Bags, Classic & Contemporary Handmade Jewelry, loose Stones, Rough, Cabs, Slabs, Geodes, Beads, Minerals, Jewelers, Wire Wrappers, lapidary Demonstrations, Adult Grand Prize, Junior Grand Prize.; contact Walter Beneze, 4204 45th Street, Lubbock, TX 79413, 806-797-5832; e-mail: walt@lubbockgemandmineral.org; Web site: www.lubbockgemandmineral.org

2-3—ANAHEIM, CALIFORNIA: Annual show; Searchers Gem & Mineral Club, Brookhurst Community Center; 2271 W. Crescent Ave.; Sat. 10:00 am-5:00 pm, Sun. 10:00 am-4:30 pm; Admission is FREE; Searchers' annual rock show with fun activities for kids! Free. See rocks, gems, minerals, fossils, beads, rough, slabs, vendors, gold panning, silent auction, hobby supplies, vintage stones, door prizes, gemstones, grab bags, tools, equipment and exhibits. Lapidary supplies. Demonstrations include stone carving, faceting, intarsia, wire wrapping and cabochon-making. Lunch, snacks and drinks are available.; contact Debra Tanner, 1148 E Sycamore Ave, Orange, CA 92666, (714) 329-0290; e-mail: Debra.Tanner@rockwellcollins.com; Web site: www.searchersrocks.org

2-3—YUCAIPA, CALIFORNIA: Show; Yucaipa Valley Gem and Mineral Society, Scherer Senior Center; 12202 First Street; Sat. 11:00 am-7:00 pm; Admission is Free!; Rock, mineral, and fossil specimens, tools, finished jewelry, demonstrations, silent auction and kids activities. Held in conjunction with the Yucaipa Music and Arts Festival, which includes many additional vendors, kids carnival, and live music entertainment.; contact Dennis Anderson, (951) 845-9195; e-mail: dennis.anderson@djanderson.net; Web site: www.yvgms.org

2-3—NORTH CHARLESTON, SOUTH CAROLINA: Show and sale; Lowcountry Gem and Mineral Society, Charleston Area Convention Center; 5001 Coliseum Drive, Exhibit Hall A; Sat. 10:00 am-5:00 pm, Sun. 10:00 am-5:00 pm; Admission is Free; A component of the North Charleston Arts Festival. Hourly Door Prizes, Lapidary Demonstrations, Fossil Dig and Geode Cracking; contact Karen Havenstein, (843) 795-2956; e-mail: webmaster@lowcountrygemandmineralsociety.org; Web site: www.lowcountrygemandmineral.org

8-10—COSTA MESA, CALIFORNIA: Wholesale and retail show; Gem Faire Inc, OC Fair & Event Center; 88 Fair Dr.; Fri. Noon-6pm, Sat. 10am-6pm, Sun. 10am-5pm; Admission \$7, Children Free (ages 0-11); Fine jewelry, precious & semi-precious gemstones, millions of beads, crystals, gold & silver, pearls, minerals & much more at manufacturer's prices. Exhibitors from around the world. Jewelry repair & cleaning while you shop. Free hourly door prizes.; contact Yooy Nelson, (503) 252-8300; e-mail: info@gemfaire.com; Web site: <http://www.gemfaire.com>

8-10—FRANKLIN (28734), NORTH CAROLINA: Annual show; Gem & Mineral Society of Franklin, NC, Carpenter Community Bldg; 1288 Georgia Rd.; Fri. 10:00 am-5:00 pm, Sat. 10:00 am-5:00 pm, Sun. 10:00 am-4:00 pm; Admission is FREE; Rough and finished gemstone and jewelry along with local crafters. Club demos and raffle.; contact Norman Holbert, (828) 634-0350; e-mail: normholbert@comcast.net

8-10—COLUMBIA, MISSOURI: Annual show; Central Missouri Rock and Lapidary Club, Knights of Columbus Hall (New Venue); 2515 North Stadium Boulevard; Fri. 12:00 pm-7 pm, Sat. 9:00 am-5:00 pm, Sun. 10:00 am-4:00 pm; Adults \$5.00, Seniors \$3.00, Students \$3.00, Children Under 11 Free; Kidz Mine and Midwest Dealers, geodes, rough rock, cabochons, beads and beaded jewelry, wire wrapping, fossils, mineral specimens, crystals, agates, spheres, faceted gemstones, and handmade silver jewelry, door prize drawings.; contact Deb Booker, 6395 North Oakland Gravel Road, Columbia, MO 65202, (573) 356-5877; Web site: <http://www.cmrlc.org>

8-10—NORCROSS, GEORGIA: Annual show; Georgia Mineral Society, North Atlanta Trade Center; 1700 Jeurgens Court; Fri. 10 am-6 pm, Sat. 10 am-6 pm, Sun. 12 pm-5 pm; Admission is Free; Auction Saturday 1:00pm. Demonstrations & Door Prizes; contact Shelly Stubbs, (404) 329-9052; e-mail: mayshow@gamineral.org; Web site: <http://www.gamineral.org>

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9-9—BIGLERVILLE, PENNSYLVANIA: Swap and sale; Franklin County and Cen Penn Rock & Mineral Clubs, South Mountain Fairgrounds; 611 Narrows Road; Sat. 8:00 am-3:00 pm; Adults \$1.00, Seniors \$1.00, Students are Free, Children are Free; contact Tom Smith, (717) 532-7204; e-mail: tsmith1012@comcast.net

9-10—BOZEMAN, MONTANA: Annual show; Bozeman Gem & Mineral Club, Gallatin County Fair Grounds; 901 North Black, Building #1; Sat. 10 am-6 pm, Sun. 10 am-4 pm; Adults \$3.00 both days, Children 12 & under free; Over 15 dealers; gem, mineral, jewelry and beads. Member and dealer displays, silent auction, grab bags, garnet tables and raffles.; contact Jerry Hancock, P.O. Box 11001, Bozeman, MT 59719; e-mail: Jaegers@bresnan.net; Web site: bozemandgemandmineralclub.com

9-10—GRAND JUNCTION, COLORADO: Annual show; Grand Junction Gem & Mineral Club, Inc., Grand Junction, Co.; Two Rivers Concession Center, 1st and Main Sts.; Sat. 9:00 am-6:00 pm, Sun. 9:00 am-4:00 pm; Adults \$3.00, Students \$1.00, Children are Free; 68th Annual show with 37 dealers, activities for the children, silent auction, door prizes, displays and demonstrations. Free parking at the convention center and lite breakfast and luncheon food is available. Show Chairman: Chuck Duncan Tele: 970/270-8068 Dealer Chairman: Bambi Harmon Tele. 970/245-1414; contact Chuck Duncan

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15-17—SACRAMENTO, CALIFORNIA: Wholesale and retail show; Gem Faire Inc, Scottish Rite Center; 6151 H St.; Fri. Noon-6 pm, Sat. 10 am-6 pm, Sun. 10 am-5 pm; Admission \$7, Children are Free (ages 0-11); Fine jewelry, precious & semi-precious gemstones, millions of beads, crystals, gold & silver, pearls, minerals & much more at manufacturer's prices. Exhibitors from around the world. Jewelry repair & cleaning while you shop. Free hourly door prizes.; contact Yooy Nelson, (503) 252-8300; e-mail: info@gemfaire.com; Web site: <http://www.gemfaire.com>

15-17—SOUTH JORDAN, UTAH: Annual show; Wasatch Gem Society, Salt Lake County Equestrian Park and Events Center; 2100 West 11400 South; Fri. 10:00 am-6:00 pm, Sat. 10:00 am-6:00 pm, Sun. 10:00 am-5:00 pm; Adults \$2.00; Come see thousands of rocks, minerals, and fossils. Lots of great dealers and large selection of club tables for kids and adults! Plus beautiful show cases showing off the wonders of the rock and mineral world!!!; contact Connie Stanton, 4734 West Harbor St, West Valley, UT 84120, (801) 209-4390; e-mail: connie.inspiredreams@gmail.com; Web site: www.wasatchgemsociety.com

15-17—SANTA ANA, CALIFORNIA: Wholesale and retail show; LLD Productions, Holiday Inn-Orange County Airport; 2726 S Grand Ave.; Fri. 10 am-6 pm, Sat. 10 am-6 pm, Sun. 10 am-5 pm; Admission is Free!; contact Regina Aumente, PO Box 665, Bernalillo, NM 87004, (505) 867-0425; e-mail: mzexp@comcast.net; Web site: www.mzexp.com

16-17—MARTINSVILLE, VIRGINIA: Annual show; Treasures Of The Earth Gem & Jewelry Shows, National Guard Armory; 315 Commonwealth Blvd. W., across from Liberty Fair Mall; Sat. 10-6, Sun. 11-5; free admission; beads, pearls, gemstones, gem trees, wire wrapping, wire sculpture, silversmiths and goldsmiths, custom work and repairs while you wait, door prizes, classes available; contact Van Wimmer, Show Director, 5273 Bradshaw Rd., Salem, VA 24112, (540) 384-6047; e-mail: van@toteshows.com; Web site: www.toteshows.com

16-17—LAKEVIEW, OREGON: Annual show; Tall Man Rock Chippers, Lake County Fairgrounds; 1900 N 4th; Sat. 10 am-5 pm, Sun. 10 am-4 pm; free; We have a good variety of vendors, activities for the kids, a silent auction featuring many of the local rocks, good food, club showcases, raffle, and field trips including the Oregon Sunstone. Camping is available on-site. No tailgating.; contact LeRoy Johnson, (541) 947-4267; e-mail: lostmyrmarbles@yahoo.com

16-17—NORTH OLMSTED, OHIO: Show and sale; Parma Lapidary Club, Soccer Sportsplex; 31515 Lorain Rd.; Sat. 10:00 am-5:00 pm, Sun. 10:00 am-5:00 pm; Admission \$6.00, Children under 12, and Scouts in uniform Free! Demonstrations, Kid's Corner, Chinese/Silent Auction, Exhibits Free Parking; contact Martha Lamparky, 1012 Chippewa Street, Grafton, OH 44044, (440) 926-3680; e-mail: jmlampa@gmail.com

16-17—WAUWATOSA, WISCONSIN: Show and sale; Wisconsin Geological Society, Mueller Building - Hart Park; 72nd and State St.; Sat. 10-5, Sun. 10-5; adults \$3 (two for \$5), children free; more than 20 dealers, exhibits, children's activities, door prizes; contact Paul Schmidt, 8213 Red Arrow Ct., Wauwatosa, WI 53213, (414) 772-1868; e-mail: pvs@wi.rr.com; Web site: www.wisgeologicalsociety.com

16-17—LAKEVIEW, OREGON: Annual show; Tallman Rock Chippers, Lakeview; 244 North M Street; Sat. 10:00 am-5:00 pm, Sun. 10:00 am-4:00 pm; Admission is Free; Field trips daily, breakfast on Sunday, silent Auction, children's treasure hunt; contact Mark Deidrich, 307 North V Street, Lakeview, OR 97630, (541) 880-8787; e-mail: mark878762@hotmail.com

16-17—PINETOP, ARIZONA: Show and sale; White Mountain Gem & Mineral Club, Hon-Dah Conference Center; 777 Highway 260; Sat. 9:00 am-6:00 pm, Sun. 10:00 am-4:00 pm; Adults \$2.00, Seniors 70+ Free, Students 18 and under Free, Children 18 and under Free; Member Displays, Raffles, Door Prizes, Silent Auction, Children Activities, Dealers, Fluorescents, Dinosaur Exhibit and Demonstrations.; contact Rick Olson, 8276 Tahoe Pl, Show Low, AZ 85901, (928) 251-0949; e-mail: walkaround@earthlink.net; Web site: whitemountain-azrockclub.org

16-17—HERMISTON, OREGON: Annual Gem and Mineral Show ; Hatrockhounds Gem and Mineral Society - Hermiston OR, Hermiston Conference Center; Highway 395 South; Sat. 10 am-5 pm, Sun. 10 am-4 pm; Adults \$2.00; contact Mike Filarski, (541) 571-2593; e-mail: stonemorlin1@netscape.net

16-17—HAMILTON, MONTANA: Annual show; Bitterroot Gem and Mineral Society, Ravalli County Fairgrounds; 100 Old Corvallis Road; Sat. 10 am-6 pm, Sun. 10 am-5 pm; Admission is Free!; contact Steve Vieth, (406) 381-7597; e-mail: viethsteve88@gmail.com

22-24—SALEM, VIRGINIA: Annual show; Treasures Of The Earth Gem & Jewelry Shows, Salem Civic Center; 1001 Boulevard; Fri. 10-6, Sat. 10-6, Sun. 11-5; \$5 (3-day pass), children (under 16) free; beads, pearls, gemstones, gem trees, wire wrapping, wire sculpture, silversmiths and goldsmiths, custom work and repairs while you wait, door prizes, classes available; contact Van Wimmer, Show Director, 5273 Bradshaw Rd., Salem, VA 24153, (540) 384-6047; e-mail: van@toteshows.com; Web site: www.toteshows.com

22-24—SANTA BARBARA, CALIFORNIA: Wholesale and retail show; Gem Faire Inc, Earl Warren Showgrounds; 3400 Calle Real; Fri. Noon-6pm, Sat. 10am-6pm, Sun. 10am-5pm; Admission = \$7, Children Free (ages 0-11); Fine jewelry, precious & semi-precious gemstones, millions of beads, crystals, gold & silver, pearls, minerals & much more at manufacturer's prices. Exhibitors from around the world. Jewelry repair & cleaning while you shop. Free hourly door prizes.; contact Yooy Nelson, (503) 252-8300; e-mail: info@gemfaire.com; Web site: http://www.gemfaire.com

22-24—SAN ANTONIO, TEXAS: Annual show; Exhibit Group International, Embassy Suite Hotel Ball Room; 7750 Briaridge Drive; Fri. 11:00 am-6:00 pm, Sat. 10:00 am-6:00 pm, Sun. 10:00 am-5:00 pm; Adults \$3.00, Children are Free; Fine Jewelry gold and diamond, fine jade selection, large choice of gem, beads and mineral stone, finding & petwer supplies, beading class, fashion jewe lry and gift more.; contact john su, 13337 South Street #633, cerrytos, CA 90703, (714) 494-4546; e-mail: egi168@hotmail.com; Web site: www.egishows.com

22-25—SCOTTSDLUFF, NEBRASKA: Annual show; Panhandle rock & gem cub, Riverside Zoo campground ; 1600 S. Beltline Hwy W.; Daily 8 am-5 pm, Daily 8 am-5 pm, Daily 8 am-5 pm, Daily 8 am-5 pm; Admission is FREE!; Free admission - Public Welcome - Public also invited to attend the rock auction Saturday evening starting at 6:30 pm. Any scout in uniform will receive a free gift. Families with children are welcome and encouraged to attend.; contact Richard Benker, 1730 M. St. , Gering, NE 69341, (308) 436-4697; e-mail: rekneb@charter.net

29-31—TULSA, OKLAHOMA: Wholesale and retail show; Gem Faire Inc, Expo Square; 4145 E 21st St.; Fri. Noon-6pm, Sat. 10am-6pm, Sun. 10am-5pm; Admission is \$7, Children are Free (ages 0-11); Fine jewelry, precious & semi-precious gemstones, millions of beads, crystals, gold & silver, pearls, minerals & much more at manufacturer's prices. Exhibitors from around the world. Jewelry repair & cleaning while you shop. Free hourly door prizes.; contact Yooy Nelson, (503) 252-8300; e-mail: info@gemfaire.com; Web site: http://www.gemfaire.com

continued on page 76

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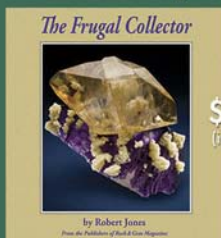
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Show Dates from page 73

29-31—WAUSEON, OHIO: Annual show; State Line Gem & Mineral Society, Fulton County Fairgrounds, Junior Fair Building; 8514 SR 108; Fri. 12:00 pm-7:00 pm, Sat. 10:00 am-7:00 pm, Sun. 11:00 am-4:00 pm; Adults \$3.00, Seniors \$2.00, Children under 12 free; contact Doris Brzezicki, 419 N Broad St, Adrian, MI 49221, (517) 263-1669; e-mail: rychar.d@tc3net.com; Web site: statelinegms.com

June 2015

5-7—BONNEY LAKE, WASHINGTON: Annual show; Puyallup Valley Gem & Mineral Club, Swiss Park; 9205 198th Ave. E.; Fri. 10-5, Sat. 10-5, Sun. 10-5; free admission; contact Nancy LeMay, PVGMC % Club Show, PO Box 134, Puyallup, WA 98371, (253) 952-6216; e-mail: bees2knees@att.net; Web site: www.puyallupgemclub.org

5-7—OCEAN CITY, MARYLAND: Retail show; Treasures of the Earth, Inc., Roland E Powell Convention Center; 4001 Coastal Highway; Fri. 12 noon-6 pm, Sat. 10 am-5 pm, Sun. 10 am-4 pm; Adults \$5.00, Military Free with ID, Children 16 and under Free; Vendors from across the US bring their merchandise to you. You will find • 14K and sterling silver, classic, estate, fashion and handmade jewelry • Loose stones, beads and findings, pearls • Mineral specimens, crystals, lapidary supplies • Books, carvings and gift items; contact Jane Westbrook, PO Box 59, Gloucester Point, VA 23062, (804) 285-4281; e-mail: jane@treasuresoftheearth.com; Web site: www.treasuresoftheearth.com

6-6—MACUNGIE, PENNSYLVANIA: Annual show; PA Earth Science Assn., Macungie Memorial Park; Macungie Memorial Park; Sat. 8:30 am-3:00 pm; Adults \$5.00; contact Vincent or Janell Olovsky, 531 Mickley Rd., Whitehall, PA 18052; Web site: mineralfest@verizon.net

6-7—COEUR D'ALENE, IDAHO: Annual show; North Idaho Mineral Club, Kootenai County Fairgrounds; 4056 North Government Way; Sat. 9 am-5 pm, Sun. 10 am-4 pm; Adults \$3, Children 12 and under Free with adult; contact Bev Bockman, (208) 773-5384; e-mail: bockbb@aol.com

6-7—NEWPORT, OREGON: 52nd annual show; Oregon Coast Agate Club, National Guard Armory; 541 SW Coast Hwy, Hwy 101; Sat. 10 am-6 pm, Sun. 10 am-4:30 pm; Adults \$2.00, Children 12 and under Free; Service Personnel in uniform Free admission Facebook: Oregon Coast Agate Club; contact George Mazeika, PO Box 293, Newport, OR 97365, (541) 991-0311; Web site: www.coastagates.org

6-7—MONROE, NEW YORK: Show and sale; Orange County Mineral Society, Museum Village; 1010 Rt. 17M; Sat. 10:00 am-4:00 pm, Sun. 10:00 am-4:00 pm; Adults \$5.00, Seniors \$3.00, Students \$3.00, Children under 6 Free; On Display The most complete Mastodon found in NY State Extensive Local Mineral Collection New Fluorescent Mineral Display Local and National Dealers Offering Minerals, Jewelry, Gems, Fossils for sale; contact George Gardianos, 5 Quaker Ridge Rd, Westtown, NY 10998, (845) 683-1167; e-mail: ggard@optonline.net; Web site: OrangecountymineralsocietyNewYork

6-7—CANANDAIGUA, NEW YORK: Annual show; Wayne County Gem and Mineral Club, Greater Canandaigua Civic Center; 250 N. Bloomfield Road; Sat. 10:00 am-5:00 pm, Sun. 10:00 am-4:00 pm; Adults \$3.00, Children Under 12 Free; vendors, exhibits, crafts, kid's activities, and more.; contact Fred Haynes, 10 Country Club Drvie, Rochester, NY 14618, (585) 203-1733; e-mail: fredhaynes55@gmail.com; Web site: www.wcgmc.org

12-14—LODI, CALIFORNIA: Annual show; California Federation of Mineralogical Societies Show, Lodi Grape Festival & Harvest Fair; 413 East Lockeford St.; Fri. 10 am-5 pm, Sat. 10 am-5 pm, Sun. 10 am-4 pm; Adults \$6.00, Children under 12 Free with adult; We will have Dealers with rough & polished Rocks, Gems, Minerals, Fossils, Beads, Craft Tools, Lapidary Equipment, Fine Jewelry & more. Showcases, & Competitions Cases, Silent Auction, Raffles, Door Prizes, 5 Different Speakers, Kids Educational Activities, Lapidary Demonstrations, & Snack Bar. On Display will be the Golden Bear, Benitoite, Meteorite from Sutter Mill, the Raw Silver Collection and the Sabor Tooth Tiger Smilodon. Submitted by Vivien Roberts E-Mail mvroberts1@comcast.net; contact Margaret Kolaczky, CA, (209) 296-5597; e-mail: markkolaczky@gmail.com; Web site: www.cfmsinc.org

13-14—BUTTE, MONTANA: Annual show; Butte Mineral and Gem Club, Butte Civic Center Annex; 1340 Harrison Avenue; Sat. 10am-5pm, Sun. 10-5; Admission = \$3, Children under 12 Free if accompanied by an adult; There will be 15 dealers in fossils, minerals, gems, jewelry, etc., 20+ exhibits, a silent auction and a kid's area.; contact Joe Slouber, PO Box 4492, Butte, MT 59702

13-14—GRAPEVINE, TEXAS: Annual show; Arlington Gem and Mineral Club, Grapevine Convention Center; 1209 South Main; Sat. 10 am-6 pm, Sun. 10 am-5 pm; Adults \$6.00, Seniors \$3.00, Students \$6.00, Children \$3.00; Annual Show, Jewelry, Gems, Minerals, Crafts, Exhibits, Classes, Memberships,

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13-14—SAN FRANCISCO, CALIFORNIA: Show and sale; Pacific Crystal Guild, Fort Mason Center; 2 Marina Blvd.; Sat. 10:00 am-9:00 pm, Sun. 10:00 am-4:00 pm; Adults \$8, Children are Free; Two weekends after the close of the country's biggest gem show in Tucson Arizona, the Great San Francisco Crystal Fair takes place at Fort Mason Center in the toney Marina District of San Francisco. Crystals mineral beads gems and jewelry - and over 40 vendors all under one roof. It's an incredible venue and an incredible show.; contact Jerry Tomlinson, PO Box 1371, Sausalito, CA 94966, (415) 383-7837; e-mail: jerry@crystallfair.com; Web site: www.crystallfair.com

13-14—CARTERSVILLE, GEORGIA: Show and sale; Tellus Science Museum, Tellus Science Museum; 100 Tellus Drive; Sat. 10:00 am-5:00 pm, Sun. 10:00 am-5:00 pm; Adults \$14, Seniors \$12, Students \$10, Children \$10; Calling all rock hounds, jewelry collectors, families and everyone fascinated by the Earth's treasures! RockFest returns to Tellus for two full days that will delight the whole family. Mark this indoor/outdoor event as a summer "must-do" on your calendar. Dealers from all over the country will bring their wares for you to browse. Some will feature rare and exotic jewelry, while others will showcase ancient fossils or colorful specimens. You will have an opportunity to purchase a one-of-a-kind find at this unique festival of merchants. And what's even better? Most dealers will also honor the Tellus member discount - that means members save 10% off your purchase! Dealers will be set up outside on the back lawn and inside the Museum in the Banquet Rooms. Hourly door prizes Free mineral specimens for the first 200 guests each day Bring your mystery mineral specimen for free mineral or fossil identification Kid's activities; contact Mary Vinson, PO Box 3663, Cartersville, GA 30120, (770) 606-5700; e-mail: maryv@tellusmuseum.org; Web site: tellusmuseum.org

19-21—SANDY, UTAH: Wholesale and retail show; Gem Faire Inc, South Towne Expo Center; 9575 S State St.; Fri. 10am-6pm, Sat. 10am-6pm, Sun. 10am-5pm; Admission = \$7, Children are Free (ages 0-11); Fine jewelry, precious & semi-precious gemstones, millions of beads, crystals, gold & silver, pearls, minerals & much more at manufacturer's prices. Exhibitors from around the world. Jewelry repair & cleaning while you shop. Free hourly door prizes.; contact Yooy Nelson, (503) 252-8300; e-mail: info@gemfaire.com; Web site: http://www.gemfaire.com

26-28—FISHERSVILLE, VIRGINIA: Annual show; Treasures Of The Earth Gem & Jewelry Shows, Augusta Expo; 277 Expo Rd., I-64 Exit 91; Sun. 10-6, Sat. 10-6, Sun. 11-5; \$4 (3-day pass), children (under 16) free; beads, pearls, gemstones, gem trees, wire wrapping, wire sculpture, silversmiths and goldsmiths, custom work and repairs while you wait, door prizes; contact Van Wimmer, Show Director, 5273 Bradshaw Rd., Salem, VA 24153, (540) 384-6047; e-mail: van@toteshow.com; Web site: www.toteshow.com

26-28—SAN DIEGO, CALIFORNIA: Wholesale and retail show; Gem Faire Inc, Scottish Rite Center; 1895 Camino del Rio S.; Fri. Noon-6pm, Sat. 10am-6pm, Sun. 10am-5pm; Admission = \$7, Children are Free (ages 0-11); Fine jewelry, precious & semi-precious gemstones, millions of beads, crystals, gold & silver, pearls, minerals & much more at manufacturer's prices. Exhibitors from around the world. Jewelry repair & cleaning while you shop. Free hourly door prizes.; contact Yooy Nelson, (503) 252-8300; e-mail: info@gemfaire.com; Web site: http://www.gemfaire.com

26-28—ELDON, MISSOURI: Annual show; Osage Rock and Mineral Club, Eldon Community Center; 309 E. Second Street; Fri. 2:00 pm-6:00 pm, Sat. 9:00 am-6:00 pm, Sun. 9:00 am-3:00 pm; Admission is Free! Theme: Gemstones of the World Features: gem stones, jewelry, geodes, fossils, minerals, quartz crystals, custom jewelry by many gifted artists, cabochons, gift items, demonstrations, displays, kids games, and prizes. A special Florescent Mineral Display will be back this year with new material!; contact Roger Varvel, 14354 Highway 64, Lebanon, MO 65536, (417) 532-4367; e-mail: rvarvel@centurylink.net; Web site: ormc2015show@centurylink.net

26-28—BEDFORD, INDIANA: Annual show; Lawrence County Rock Club, Lawrence County Fairgrounds; Hwy 50; Fri. 10:00 am-6:30 pm, Sat. 9:00 am-6:30 pm, Sun. 10:00-4:00 pm; Admission is Free! Theme: Gemstones of the World Features: gem stones, jewelry, geodes, fossils, minerals, quartz crystals, custom jewelry by many gifted artists, cabochons, gift items, demonstrations, displays, kids games, and prizes. A special Florescent Mineral Display will be back this year with new material!; contact Roger Varvel, 14354 Highway 64, Lebanon, MO 65536, (417) 532-4367; e-mail: rvarvel@centurylink.net; Web site: ormc2015show@centurylink.net

27-28—GILSUM, NEW HAMPSHIRE: Annual show; Gilsun Recreation Committee, Gilsun Elementary School & Community Center; 640 Route 10; Sat. 8:00 am-6:00 pm, Sun. 8:00 am-4:00 pm; Admission is Free! The Gilsun Rock Swap and Mineral Show attracts thousands of rock and mineral enthusiasts from across the country each year. The event, known for its scenic location and small-town hospitality, will take place on the weekend of June 27-28, 2015 at the Gilsun Elementary School & Community Center, 640 Route 10 in Gilsun, NH. All monies raised by this event go to community recreation programs. Admission is free, although we do accept donations. This year's event includes a two special presentations. Saturday, June 27th at 1:00 PM, geologist and collector Nancy Swing will discuss "Rock Hounding in New England." Swing is a former professor of Geology and Oceanography at the Community College of Rhode Island, has been the featured speaker at the East Coast Gem and Mineral show for the last 14 years, and is a regular at the Gilsun Rock Swap & Mineral Show. Then at 2:00 PM noted rock hound Steve Garza will demonstrate the correct way to break a rock - and let visitors give it their best shot; contact Robert Mitchell, 640 Route 10, Gilsun, NH 03448, (603) 357-9636; e-mail: gilsunrocks@gmail.com; Web site: <http://www.gilsun.org/rockswap>

27-28—CULVER CITY, CALIFORNIA: Annual show; Culver City Rock and Mineral Show, Veterans Memorial Auditorium; 4117 Overland Blvd.; Sat. 10:00 am-6:00 pm, Sun. 10:00 am-5:00 pm; Admission is Free! The Culver City Rock and Mineral Club will present its 54th Annual Fiesta of Gems show on Saturday, June 27, 2015, from 10 a.m. - 6:00 p.m. and Sunday, June 28, 2015, from 10:00 a.m. - 5:00 p.m. at the Veterans Memorial Auditorium, 4117 Overland Blvd., Culver City, CA 90230. This year the featured gem stone is Quartz Crystals. Admission and parking are free. Fiesta of Gems Show offers over 35 gem and mineral dealers from California, New Mexico, and Arizona who will sell minerals, gems, slabs, cabochons, beads, and jewelry findings. The Culver City Rock and Mineral Club members will exhibit gem and mineral works of art, jewelry pieces, and private collections of gems and minerals. There will be classes throughout the weekend introducing various techniques of jewelry making; contact Janice Metz, CA, (310) 850-4398; e-mail: janicemtz@yahoo.com; Web site: <http://www.culvercityrocks.org/fiesta.htm>

July 2015

11-12—CASPER, WYOMING: Annual show; Natrona County Rockhounds Club, Parkway Plaza Hotel; 123 West E Street; Sat. 9 am-5 pm, Sun. 9 am-4 pm; Adults \$3.00, Children under 12 Free; Demonstrations, door prizes, raffle, and silent auction; contact Tom Catania, 634 South Melrose, Casper, WY 82601, (307) 258-4884; e-mail: catania82601@aol.com

11-12—BETHEL, MAINE: Annual show; Oxford County Mineral & Gem Association, Telstar High School; RTE#26; Sat. 10 am-5 pm, Sun. 10 am-4 pm; Adults \$3.00, Children under 12 are FREE! This is our 54th annual show. We offer Mineral displays of local Minerals. We have 14 dealer's selling Jewelry and Mineral Specimens from assorted locations. We also offer guided Field Trips to a local mine each day. You must be at the show to sign up for the field trip. Field trip's leave each day by 11am.; contact Dennis Gross, 178 N. Main Street, Bryant Pond, ME 04219, 207-665-2759; e-mail: mincoll@megalink.net

16-18—CODY, WYOMING: RMFMS Mineral & Gem Show; WY State Mineral and Gem Society, Cody H.S. Sweetzer Gymnasium; 920 Beck Avenue, Cody, WY 82414; Thu. 4:00 p.m.-8:00 p.m., Fri. 10:00 am-8:00 pm, Sat. 10:00 am-4:00 pm; Adults \$4.00, Students \$2, Children are Free! Annual Rocky Mountain Federation of Mineralogical Societies Mineral and Gem Show will feature: Multi-State Dealers, Demonstrations/ Displays, Educational Activities, Kids Activity Area, Speakers, and Field Trips.; contact Stan Strike, 2132 Gail Lane, Cody, WY 82414, (307) 250-1244; e-mail: wsmgspress@wymineralandgemsociety.org; Web site: www.wymineralandgemsociety.org

17-19—VIRGINIA BEACH, VIRGINIA: Retail show; Treasures of the Earth, Inc., Virginia Beach Convention Center; 1000 19th St.; Fri. 12 noon-6 pm, Sat. 10 am-5 pm, Sun. 10 am-4 pm; Adults \$5.00, Military Free with ID, Children 16 and under Free; Vendors from across the US bring their merchandise to you. You will find • 14K and sterling silver, classic, estate, fashion and handmade jewelry • Loose stones, beads and findings, pearls • Mineral specimens, crystals, lapidary supplies • Books, carvings and gift items Displays and demonstrations by the two Gem & Mineral Societies in the area Appraisals available on site; contact Jane Westbrook, PO Box 59, Gloucester Point, VA 23062, (804) 285-4281; e-mail: jane@treasuresoftheearth.com; Web site: www.treasuresoftheearth.com

18-19—ERIE, PENNSYLVANIA: Show and sale; Gem City Rock & Mineral Society, JMC Ice Arena; 423 W 38th Street; Sat. 10:00 am-6:00 pm, Sun. 10:00 am-5:00 pm; Adults \$4, Seniors \$3, Children under 12 Free; 46th annual show and sale; rocks, gems, jewelry, minerals, fossils, wire wrapping, beads, Discovery Blocks, door prizes, activities for children; contact Bob Gallivan, (814) 454-6770; e-mail: gallivan@lycos.com; Web site: www.gemcityrockclub.org/show

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Show Dates from page 77

18-19—MOOSE LAKE, MINNESOTA: Annual show; Carlton County Gem and Mineral Club, Moose Lake High School; 413 Birch Avenue; Sat. 9:00 am-5:00 pm, Sun. 9:00 am-4:00 pm; Admission is Free!; 46th Annual Show/Agate Days; Carlton County Gem & Mineral Club and Moose Lake Area Chamber of Commerce; Moose Lake High School gym and rear parking lot, 413 Birch Ave; Sat 9-5, Sun 9-4; Free Admission; dealers, Lake Superior agate, cutting materials, specimens, crystal groups, fossils, gems, jewelry, lapidary equipment, rough rock tailgaters, door prizes, field information. Agate Stampede Sat 2 pm Elm St.; Contacts: Re Inside vendors: Gary Pitoscia, 815 N 13th Ave East, Duluth, MN 55805 218 724-1894, pitosciajg@charter.net; Tailgaters: Carol Risdon 113 Ave C #1, Cloquet, MN 55720, 218 879-3968, carolannrisdon@gmail.com. Free Admission to Geological Center, Moose Lake State Park; contact Ted Chura, 570 Marshall Street, Duluth, MN 55803-1981, (218) 728-1082; e-mail: tedcgo@yahoo.com

August 2015

7-9—WEST SPRINGFIELD, MASSACHUSETTS: Wholesale and retail show; Martin Zinn Expositions, L.L.C., Eastern States Exposition - Better Living Center; 1305 Memorial Dr.; Fri. 10:00 am-6:00 pm, Sat. 10:00 am-6:00 pm, Sun. 10:00 am-5:00 pm; Adults \$6.00, Children are Free!; Huge air-conditioned hall with over 200 vendors in retail and wholesale (registration required) sections. Free lectures by popular speakers, free mineral identification, free mineral samples for all kids, and hourly door prize drawings. Also available for a small fee are slice-panning for gems or fossils, and geode cracking. Fine minerals, fossils, gems, jewelry, beads, meteorites, lapidary supplies and decorator items in all price ranges.; contact Regina Aumente, PO Box 665, Bernalillo, NM 87004, (505) 867-0425; e-mail: mzexpos@gmail.com; Web site: http://www.mzexpos.com/east_coast.html

8-9—WALNUT CREEK, CALIFORNIA: Show and sale; Pacific Crystal Guild, Civic Park Community Center; 1371 Civic Drive; Sat. 10:00 am-6:00 pm; Adults \$8, Children are Free!; Get ready for THE SUMMER CONTRA COSTA CRYSTAL FAIR which includes a magical mix of crystals, minerals, beads, and jewelry. Whether it's stone beads from Nepal, amethyst geodes from Madagascar, jade from China, or jewelry from northern California artisans—you'll find it at the Crystal Fair at below market prices. You'll also find an aura camera, tarot reader, sound healer, massage therapist, reiki master and many others - 30 booths in all. The exact location is the Civic Park Community Center at 1375 Civic Drive at Broadway in Walnut Creek. The hours are 10am to 6pm on Saturday, August 8; and 10 am to 4 pm on Sunday, August 9. Admission is \$8 (under 12 free). There is plenty of free parking and the downtown Walnut Creek BART station has a shuttle to Civic Park. For info: Jerry Tomlinson at (415) 383-7837; contact Jerry Tomlinson, PO Box 1371, Sausalito, CA 94966, (415) 383-7837; e-mail: jerry@crystalfair.com; Web site: www.crystalfair.com

14-15—TAHLEQUAH, OKLAHOMA: Annual show; Tahlequah Rock & Mineral Society, Tahlequah, OK; 300 W. First St; Fri. 9:00 am-6:00 pm, Sat. 9:00 am-5:00 pm; Adults \$3.00 18 and over; Fluorescence and other Educational displays, Silent auction, Demonstrations, Children's Games, Door Prizes and Snack Bar.; contact Sara Brasel, 14236 Cross Timbers Rd, Tahlequah, OK 74464, (918) 284-5770; e-mail: rockhoundsally@aol.com; Web site: tramsok.webs.com

14-16—PORT TOWNSEND, WASHINGTON: Annual Rock and Gem Show in conjunction with the Jefferson County Fair; Port Townsend Rock Club, Jefferson County Fairgrounds; 4907 Landers Street; Fri. 10 am-9 pm, Sat. 10 am-9 pm, Sun. 10 am-6 pm; Admission is Free for show, -- fair has gate fees; Fair admission gate prices Adults - \$6 Seniors (65+) - \$5 Students (13 - 17) - \$5 Children (6 - 12) - \$2 Age 5 and under - free Three-day Season Tickets include Sunday's Beef BBQ in Advance \$13 at gate \$15; contact Garnett Brooks, (360) 379-5531; e-mail: garnett@email.com

14-16—GRAND RAPIDS, MICHIGAN: Faceting Seminar; Midwest Faceters Guild, Tallmadge Township Hall; 0-1451 Leonard NW; Fri. 4:30 pm-8:00 pm, Sat. 8:30 am-5:00 pm, Sun. 8:30 am-5:00 pm; Admission = see information; Learn to Facet - classes in beginners - all equipment furnished - Advanced - bring your machine and rough and we will assist you with new techniques and designs - GemCad - a computer aided software for gemstone designs. - Need to bring a laptop. Price for beginners class and Gem-Cad is \$95.00 - Advanced classes are \$50.00 - Information packets will be mailed upon request.; contact Barb Yost, (616) 254-9777; e-mail: barbandben@gmail.com

15-16—BOSSIER CITY, LOUISIANA: Annual show; Arklatex G&M Society, Bossier City Civic Center; 620 Benton Rd; Sat. 10:00 am-5:00 pm, Sun. 10:00 am-5:00 pm; Adults \$4.00, Students \$1.00, Children under 12, and scouts in uniform are Free!; "Earth Treasures of Louisiana", Custom and Unique Jewelry, Gems, Minerals, Fossils, Educational Exhibits and Kids Games.; contact Del Glasner, P.O. Box 6633, Bossier City, LA 71171-6633, (318) 517-7372; e-mail: larockclub@gmail.com; Web site: larockclub.com

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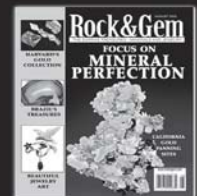
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O IN THE ROCKS

My Busy 2015 Schedule

When I turned 88 last summer, a couple of friends thought I was nuts for planning so much for 2015. I disagreed. Keeping active is one of the things that helps me keep fit and happy. It also slows the deterioration of the grey matter we all gradually experience. Giving lectures is important, for it still energizes me.

The first talk I gave this year was in nearby Sun City, Arizona. Folks there are still active, going on collecting trips and supporting a fine, small mineral museum. I have a dozen others planned.

On Monday, Feb. 9, just as things began to get lively in Tucson, I gave an evening talk at the excellent Pueblo International Show, managed by Maurice Destouet. Aisha and Jan of Rockaholics—wonderful folks who deal in fine minerals from Pakistan, India and Afghanistan—invited me to join several other speakers in their special evening lecture program.

I was in pretty fine company, including my friends John White, Mary Fong Walker, Dom Lum, Peter Megaw and Federico Barlocher. I'm not sure whose lectures I liked the most, but I had no complaints about the plentiful wine and refreshments that followed. It was a great way to kick off my biggest mineral event of the year.

The Tucson shows were outstanding, as usual. Folks from all over the world were there. Dealers had brought their "best of the best", as they sometimes say. With several really special gem and mineral shows going on, I was hard pressed to see it all in my available time. Of the more than 40 separate shows going on, many of them wholesale only, I focused on the mineral shows at Westward Look, Hotel Tucson City Center, the 22nd Avenue Show, and the Main Show, run by the Tucson Gem & Mineral Society in the Convention Center. I was still hard pressed to see as much as possible in the allowed time.

Once the amazing TGMS show got started, I went to work with the video production company BlueCap Productions. They always film as many of the exhibits



My 2015 schedule includes giving more than a dozen talks at rock shows across the country.

as possible and interview many dealers to document the minerals they have for sale. Called "What's Hot in Tucson", the resulting DVD is an important documentation of the hobby as it is today, and acts as an important historical record that collectors can reference in the years to come. The DVD is available for purchase online by August. I always enjoy co-hosting these DVDs with David Wilber and whoever else comes along, including my son Evan Jones. My wife, Carol, had her usual booth at the Main Show, which made it pretty easy to find me when I wasn't with BlueCap.

Right after Tucson, I gave a talk at my home club, The Mineralogical Society of Arizona. This is a very special club. It was started in 1935 by then-State Curator of Minerals Arthur Flagg. Arthur was very active in getting local collectors involved, and during the early years of his tenure, he was one of the several people who established the Rocky Mountain Federation of Mineralogical Societies.

My talk was a bit different. This time, instead of describing one of my adventures or some mineral group, I gave a brief chronology of the development of the science of modern mineralogy. It all began with the discovery of phosphorus in 1669, followed less than a century later by Georg Agricola's text on mining and minerals, *De Re Metallica*. The Age of Discovery in the 17th and 18th centuries culminated with Dmitri Mendeleev's publication of his Periodic Table of the Elements.

Another very important event on my schedule, which will happen right after publication of this column, is the Eastern Fed-

eration of Mineral Society retreat at Wildacres, held each spring and again in the fall, in western North Carolina. I never make the fall retreat because it conflicts with the Denver shows, but every three years since 1982 I've lectured there. It so happens that 2015 is only two years since I was at Wildacres, but I requested an earlier participation and Bruce Gaber, who really does a masterful job of organizing Wildacres programs, agreed to invite me a year early.

Wildacres is a wonderful educational retreat. The mountainous setting is delightful and the place is in close proximity to the Spruce Pines area, where abundant mineral dealers, fee-digging sites, and even some accessible mine properties help make the week a lot of fun. I give a talk each day, and the rest of the time I join in on the very useful mineral and lapidary classes, where folks can learn a wonderful range of skills.

My next significant lecturing activity will be at the top-notch East Coast Gem, Mineral & Fossil Show at the Big E Fairgrounds in West Springfield, Massachusetts. This show runs for three days, starting on Aug. 7 this year. I really enjoy this show because there are tons of dealers and an amazing array of special mineral displays in more than 50 glass cases. This year, the Marty Zinn private collection, which I have already seen and admired, will be featured!

I enjoy this show in particular, since I cut my eyeteeth on mineral collecting in Connecticut and did my master's thesis on Connecticut minerals. The first mineral club I joined was the New Haven Mineral Club back around 1949, so I still have a few decrepit old friends back there, as well as family members to visit.

The 2015 East Coast Show will really be special for me. I'll give three lectures, which will give me a chance to see plenty of old friends who come to take a nap! But what makes this year's show special is that my son Evan has also been invited to give a lecture. Having a father and son lecturing on the same show program will certainly be a first for the East Coast Show—and

maybe for all shows. As of this writing, I have not fully decided what my three talks will cover.

Marty Zinn, the show promoter, and I are longtime friends. I've been enjoying his shows in Tucson, Denver, California and Massachusetts for decades. We have traveled in Europe together, and through dozens and dozens of lectures I've supported the East Coast Show ever since it moved into the West Springfield Big E Fairgrounds.

Visiting the show on the Fairgrounds in West Springfield holds a special meaning to me. These grounds were originally called "The Eastern States Exposition Fairgrounds". I know that because, as a kid in the 1930s, I used to go there with my father. We did not go to enjoy the rides; Dad went to be a judge of pigeon exhibits during the annual fair. I went to enter my pigeons, a variety known as African Owls, into competition.

My dad's interest in feathered creatures dates back to the late 1800s when he was a coal miner in Wales. All coal miners carried a canary underground with them in the days before proper ventilation in coal mines. If your canary died on the job you bailed out of the mine as quickly as possible because methane was getting to dangerous levels.

Be that as it may, my Dad graduated into raising pigeons once he came to this country. He got so skilled at it that he was often invited to be a judge at major competitions, including the Eastern States Exposition. Incidentally, he did not judge my African Owls in competition but in spite of that I did very well with my birds garnering blue ribbons most of the time. Anyway, you can see why going to the Big E these last decades had a special meaning for me.

Later in August, I'll be in Dallas for the very special Dallas Mineral Collecting Symposium. This is one I wouldn't miss, and neither should you! The lectures are really top notch, and the social events are special because we get a chance to visit with some of the top dealers and collectors in the hobby. The Perot Museum of Nature and Science has hosted an evening in the past, but as of this writing, a reception at the symposium hotel has been scheduled instead.

On another evening, The Arkenstone Dallas Gallery holds a very relaxing social gathering that gives visitors a chance to peruse the drawers and drawers of minerals. I enjoy seeing old classics and the newest species from all over the world. The entire symposium weekend has become one of the more important highlights of the mineral-collecting season. Check it out online at www.dallassyposium.org.



The September shows in Denver center around The Denver Gem and Mineral Show.

Just a few days after the Dallas Symposium, we head for Denver, where a host of mineral, lapidary and fossil shows are going on during the month of September. All the shows are centered on the long-running Denver Gem and Mineral Show in the Denver Mart Expo Hall (formerly the Denver Merchandise Mart). This is a regional club show, while the others are run by promoters. The Denver Gem and Mineral Show people do a fine job of bringing in very fine displays from museums, dealers, and private collectors. I've been going to this show for decades and always enjoy it.



When you take classes at the May EFMS lapidary retreat in Wildacres, North Carolina, you can also enjoy a field trip.

Coincidentally, Zinn Expositions puts on the Colorado Mineral & Fossil Show in the nearby Ramada Plaza Hotel. This is a very fine show that has been going on for years. I never miss it, even though it is strictly a dealer show, with no exhibits. Leading things off in Denver is the elegant Fine Mineral Show in the Denver Marriott West hotel near Golden. This show starts a day before the Zinn show and is only four days long, so it ends while the Ramada Show is still ongoing. There is no need to be concerned about missing something, since the shows overlap.

Close to the Ramada Show is a largely lapidary and jewelry show that I always walk through. All sorts of lapidary material and jewelry are offered in a largely outdoor setting. Finally, in the Denver Coliseum, next to Interstate 70, is an exceptionally large show.

Inside the two-level Coliseum, a number of fine dealers offer a full range of jewelry, lapidary supplies, and gemstones, and the huge parking lot behind the Coliseum holds about 50 tents that house an amazing assortment of mineral-related goods. Artists who create wonderful objects, skillful lapidaries, and equipment demonstrators are housed in this area.

All in all, no fewer than five shows are held in the Denver area in September. To call this event a mini-Tucson would not be far from the truth. I'll hit all the shows, spending most of my time at the Ramada Inn and at the Main Show in the Denver Mart, where Carol and Evan each have a sales booth.

In October, I've got a problem. The finest European show, *Mineralientage München*, in Munich, Germany, is a show I certainly enjoy visiting. Last year's event featured meteorites from all over the world. This show also hosts a great range of mineral and gem dealers, from local rockhounds who offer what they have dug to some of the top mineral dealers from all over the world. This is really the place to be in late October. BlueCap Productions has done a great job of documenting this show, and while I am there, I help host the DVD.

But in 2015, I won't go there.

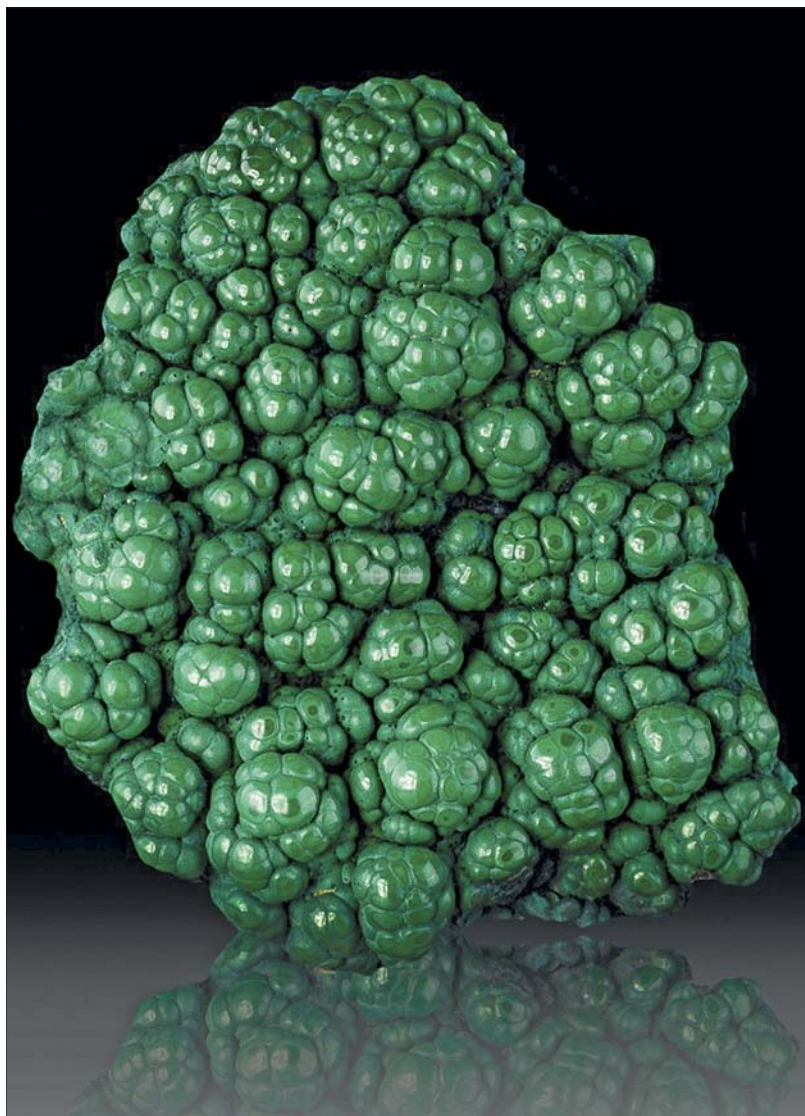
This year, the American Federation of Mineral Societies (AFMS) and the Austin Mineral Club have joined forces to hold the American Federation National Show on the same weekend as the Munich Show. What to do? I can't be in two places at once, especially when they are thousands of miles apart. My plan is to be at the Austin, Texas, show Oct. 23-25.

Once the National Show is over, my mineral show calendar is complete for 2015. That does not mean I'm staying home, though! Carol is an expert silversmith and jeweler and will be doing two shows in early November, one at the Merchandise Mart in Denver and another at the Exposition Center in Colorado Springs the next weekend.

What's that old expression: "No rest for the wicked"? I really didn't think I was that bad. All I do is enjoy myself in the greatest hobby in the world! 💎

Bob Jones holds the Carnegie Mineralogical Award, is a member of the Rockhound Hall of Fame, and has been writing for *Rock & Gem* since its inception. He lectures about minerals, and has written several books and video scripts.





Botryoidal Malachite

From the Musonoi mine, in Katanga Province, D.R. Congo, this malachite has been polished to reveal the intensely colored alternating bands of light and dark green, which create bull's-eye patterns. The piece is from the collection of the late Sam Chatti, a well-known Congo mineral dealer. It dates back to 1994, when a spectacular batch of malachite was recovered from the mine.

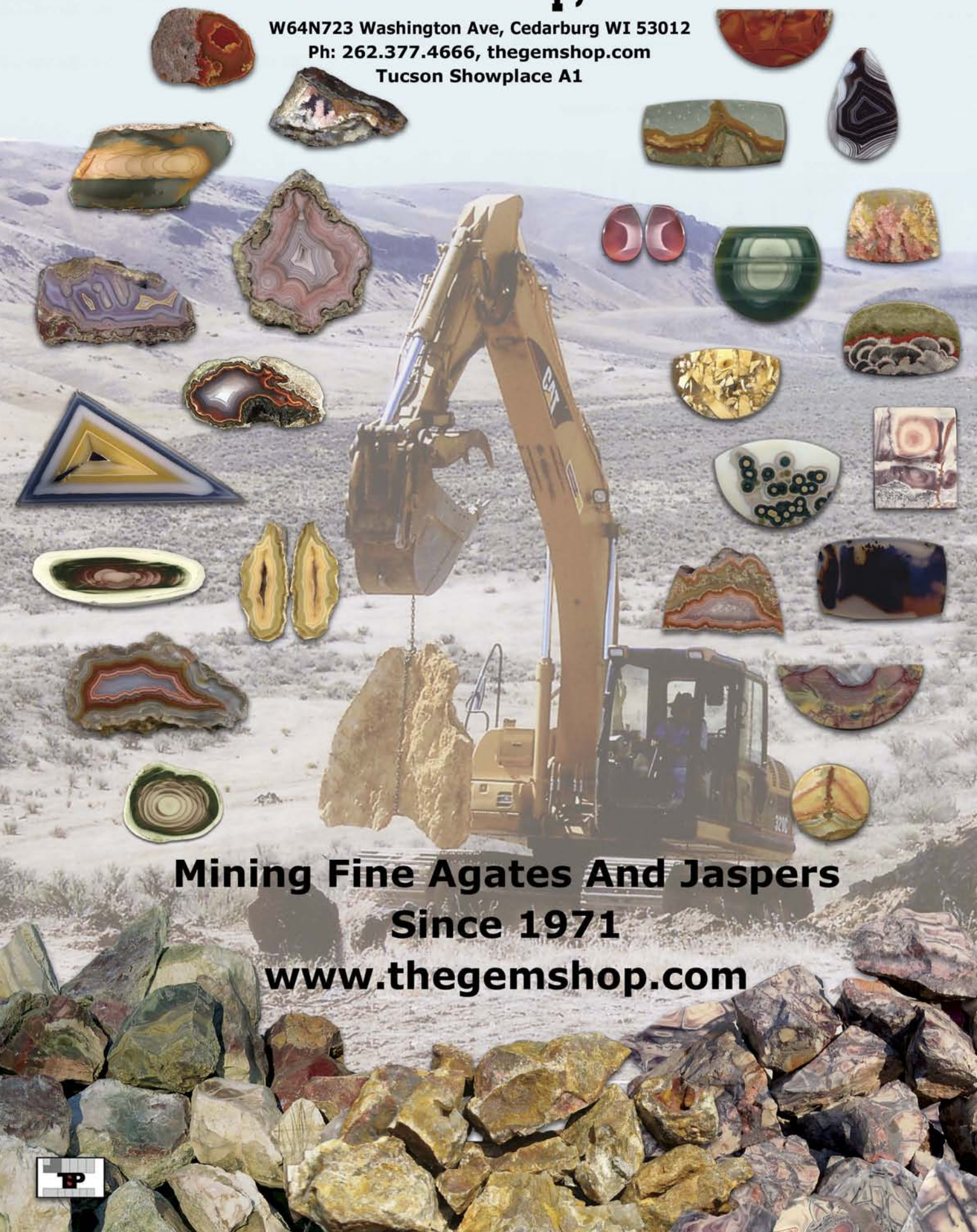
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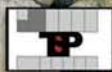
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